the Iron Age
A Chilton Publication
THE NATIONAL METALWORKING WEEKLY • AUGUST 19, 1954

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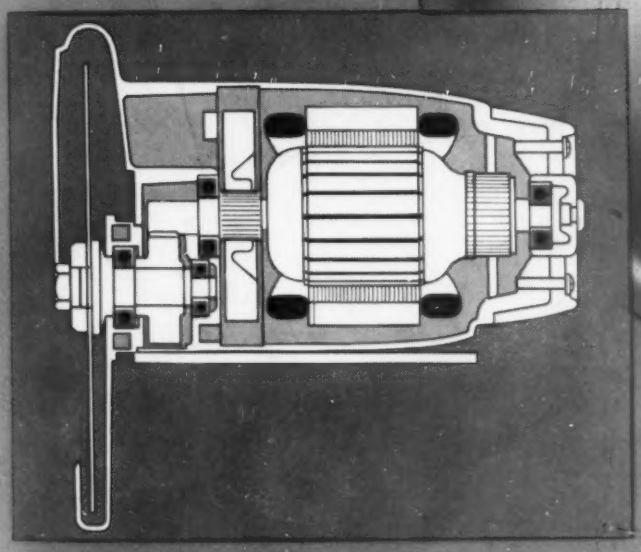
BUILDING BOON!

New Departures assure smooth, high-speed operation for Porter-Cable tools!



Four New Departure ball bearings in Porter-Cable's No. 115 saw contribute importantly to its dependable, trouble-free operation.

NOTHING ROLLS LIKE A BALL

Long hours of heavy work without letup! New Departure precision **ball** bearings help keep Porter-Cable's No. 115 saw on the job. These bearings preserve alignment of moving parts under all conditions . . . require almost no upkeep . . . assure smooth, clean cutting and a cool-running motor for hours on end.

New Departure **ball** bearings bring advantages like these to hundreds of machines and appliances. Whether improving a product or designing a new one, *talk with your New Departure engineer*. He'll help you get maximum efficiency and economy in bearings.

NEW DEPARTURE
BALL BEARINGS

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT
Plants also in Meriden, Connecticut, and Sandusky, Ohio
In Canada: McKinnon Industries, Ltd., St. Catharines, Ontario

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NEW!

ROTOR AIR SCREW DRIVERS AND NUT SETTERS

Powerful! Light!

- Rugged . . . long-life construction
- More power per pound
- Simplified torque adjustment
- 3 types of drives
- Reversible or non-reversible motors

TYPICAL SPECIFICATIONS

Reversible* . . . Adjustable Clutch† Type

Type	Handle ¼" Air Inlet	Free Speed at 90# Pres.	CAPACITY Free Run. Screws	Bolt Size	Wt. (Lbs.)	Lgth. (Ins.)	Spindle Side to Center (In.)
S-02-PRC	Pistol	2000	#2 to #12	To ¼"	2¼	8¾	25/32
S-02-PRC	Pistol	850	#2 to #12	To ¼"	2½	9¼	25/32
S-02-PRC	Pistol	450	#2 to #12	To ¼"	2½	9¼	25/32
S-02-LRC	Lever	2000	#2 to #12	To ¼"	1⅞	10	25/32
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*Also Non-Reversible †Also Positive Clutch and Direct Drive

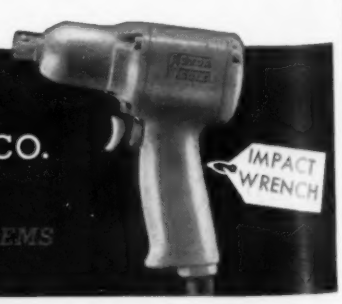
Here's how to drive assembly costs down

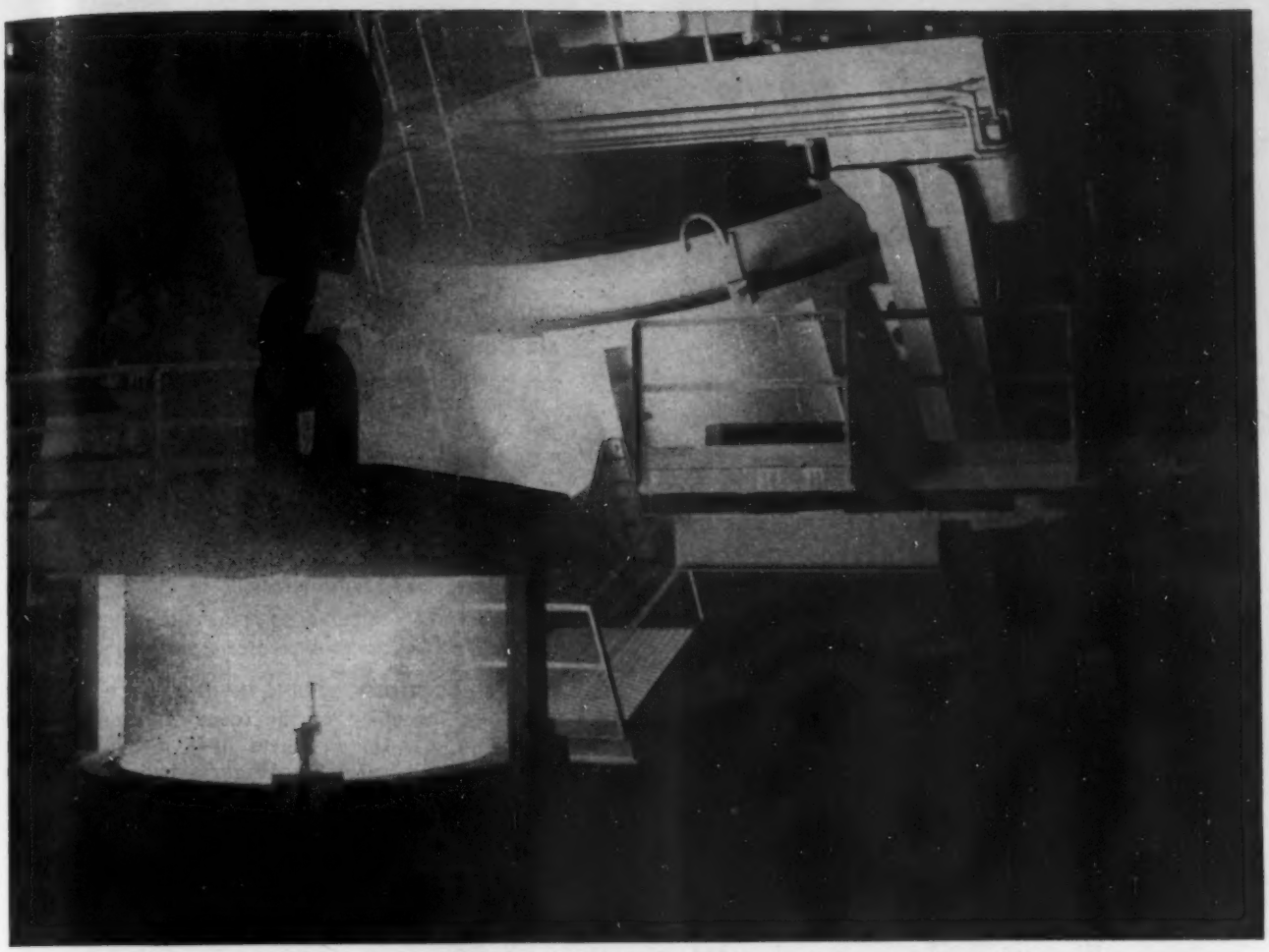
WRITE FOR BULLETIN No. 46

THE ROTOR TOOL CO.

CLEVELAND, OHIO

UNBIASED ANALYSIS OF PORTABLE TOOL PROBLEMS





Situated on a 65-acre, L-shaped tract, the modernized Los Angeles plant produces bars, rods, wire, bolts and nuts, light structural shapes. All steel is made in the plant's three electric furnaces.

OLD-TIMERS WOULDN'T KNOW THE PLACE

It's virtually a new steel plant that Bethlehem Pacific operates today in Los Angeles. It has been so expanded and modernized in the past eight years that it bears little resemblance to the plant which operated at an annual capacity of 117,000 tons at the close of World War II. Largest and most modern of Bethlehem Pacific's three plants on the West Coast, its annual ingot capacity has been boosted to 402,000 tons—nearly four times its potential in 1946.

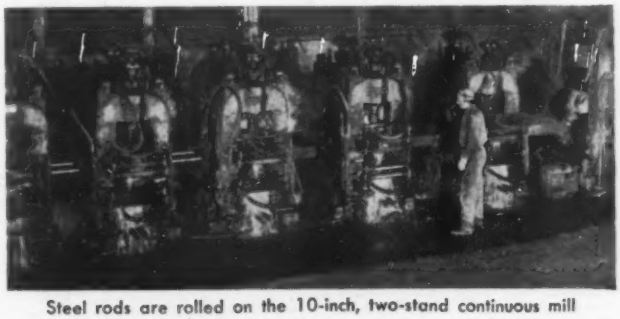
This program has not been one of expansion alone. Modernization of all phases of steel production has been carried on steadily. Production equipment has been either replaced or rebuilt to such an extent that old-timers just wouldn't recognize it today.

Three new electric furnaces have replaced the veteran open-hearth furnaces. Two new rolling mills were installed; a third has been completely rebuilt. A new wire mill, the first to serve the Southwest, has been producing wire since 1948. The larger bolt and nut plant has been streamlined to produce a greater variety of fasteners and steel specialties. Laboratories, scrap handling, reinforcing bar fabricating shops and other facilities have been improved and enlarged.

With other steelmaking plants at South San Francisco and Seattle, together with steel fabricating works and other facilities on the West Coast, Bethlehem Pacific is continuing its program of modernization. Producing many forms of high-quality steel is our part in the growth and progress of the West.

BETHLEHEM PACIFIC COAST STEEL CORPORATION

Sales Offices: Los Angeles, San Francisco, Portland, Seattle, Spokane



Steel rods are rolled on the 10-inch, two-stand continuous mill at speeds up to 42 miles per hour, and bars at half that speed.

BETHLEHEM PACIFIC BETHLEHEM STEEL

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NEW!

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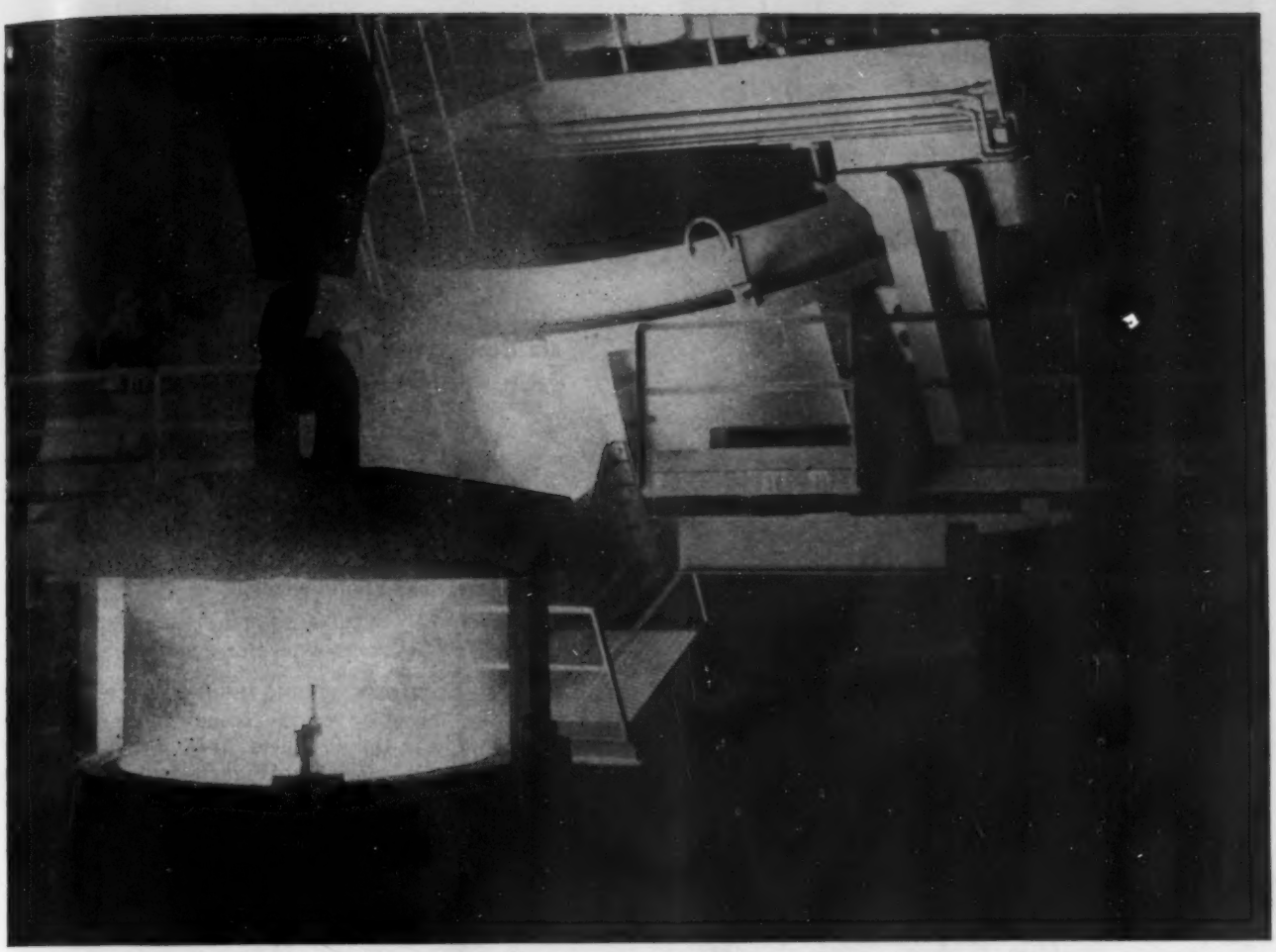

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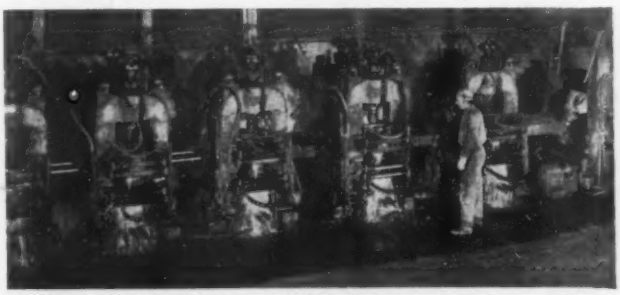

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BETHLEHEM PACIFIC

BETHLEHEM STEEL

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the Iron Age

Vol. 174, No. 8, August 19, 1954

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NEWS DEVELOPMENTS

AIR CONDITIONING GROWS DESPITE PROBLEMS—P. 73

Air conditioning has come of age, but it's still plagued by growing pains. Cool weather in the early summer slowed the season's sales. But the industry will still edge past its best previous year. Inadequate wiring in many homes is another problem the industry has to cope with. But units are better and growth is assured. Trends are toward centralized units, lower cost homes. Winter-summer units would help ease the problem of peak power load requirements.

IKE SEES ECONOMY STRENGTHENING — P. 75, P. 93

In taking inventory of the economy for the first 6 months of '54, the President finds many signs that better business is coming. Figures indicate recession hasn't been so bad as the publicity it received would indicate. First half '54 though not up to level of same period last year is running at '52 pace. Sharpest drop is in industrial production index.

SURVEY STUDIES FOUNDRY PENSION PLANS — P. 76

A survey by the National Foundry Assn. shows that pensions are commonest among firms employing 200 to 500 workers. Trusteed plan is used by most, group annuity contract next most common.

STUDEBAKER PAY VOTE MAKES LABOR HISTORY—P. 77

Union local agreement to wage cut and contract modifications ends precedent-setting Studebaker labor negotiations. But South Bend wages are still higher than Big Three scales. Studebaker policy has been model union relationship, but cost-plus contracts and postwar auto demand helped hiked wages to dangerous levels. Abuse of seniority privileges was notable. Wage cuts important but no panacea.

PLANT TOURS TEACH ECONOMIC FACTS — P. 83

Properly conducted plant tours are proving an effective means of economic education for students and civic groups. Industry-community understanding is important. ACES acts as "middleman."

INDEPENDENT STAMPERS STILL SCRAMBLE — P. 85

A little upturn has come into view for some independent metal stampers but business is still slow. Auto mergers cut deeply into stampers' markets. But boost in automotive production would still be enough to cure stampers' current sales ailments.

IN METALWORKING

ENGINEERING & PRODUCTION

TOLERANCE CHARTS CUT FINISHING COSTS — P. 121
Low finishing costs on heat treated precision steel parts are possible through close control of rough machined dimensions. Too much stock allowance means unnecessary metal removal. Too little allowance means reject parts. Combining maximum, minimum and mean values gives exact stock allowance for any size.

AIR CONDITIONING BOOSTS WORKER OUTPUT — P. 125
Cost of air-conditioning rooms where workers can take a breather after hot, humid work periods is minor compared to possible production gains. Continuous work at high temperatures and humidity causes progressively higher pulse rates, even a slight fever. Short, cool rest periods keep heart rates down, morale up.

RADIATION EFFECTS ON REACTOR METALS — P. 128
Engineers will have to consider these factors when nuclear reactors come into use for peacetime power. Materials generally show higher yield strength, lower percentage elongation, somewhat higher ductile-brittle transition temperatures. Degree of change seems tied to flux intensity and exposure temperature.

NEW BYPRODUCT IS PURE IRON POWDER — P. 132
A byproduct from processing electrolytic sheet iron provides the raw material for a new source iron powder of high purity. Tests indicate its suitability for production of high density, high strength parts. Semiproduction quantities are now being tested.

BIG FIXTURES LOAD, UNLOAD CONVEYORS — P. 134
When subassembly cannot be done on a moving conveyor, use of the conveyor line need not be ruled out entirely. Speed and convenience of conveyor systems can be utilized by transfer fixtures which carry work between the conveyors and fixed work stations. Units are timed for perfect pick-off of moving work.

MARKETS & PRICES

REFRACTORY MAKERS SEE FALL REBOUND — P. 79
Refractory makers think they have hit bottom and that third quarter business will be better. Inventories of steel companies are at rock bottom. Buying would probably increase without a steel upturn. Competition has been rugged, resulted in price trimming by smaller firms which big ones won't meet.

STEEL PEOPLE TRY INVENTORY GUESSING GAME—P. 81
Try to estimate steel tonnage in the hands of consumers and you find out right away that there aren't many benchmarks to show the way. Steel sources estimate consumption is running 10 pct ahead of shipments.

CAR BUYERS BOOST FACTORY DELIVERIES — P. 96
Economics of freight savings plus the attractions of vacation travel have brought new car purchasers to Michigan factory yards in ever increasing numbers. Sales are still made through local dealers, who net same commissions. Trend still growing.

SMALL USERS HOLDING STEEL MARKET STEADY—P. 175
While national attention remains focused on large steel consumers such as the auto industry, much of current market support is from small manufacturers. These small users, together with construction and oil country consumers, are keeping the market from slumping while all await new auto orders.

AUGUST STEEL MARKET SHOWS NO UPTURN — P. 177
Sales executives underestimated consumer shutdowns. Instead of predicted upswing, August sales may be the lowpoint. However, signs point to end of slump and the mills are setting their sights on September.

NEXT WEEK:

RAPID INDUCTION HARDENING IMPROVES GEAR LIFE
Improvements in induction hardening techniques have resulted in increased tooth hardness on large gears, adding greatly to gear life. Localized, selective hardening cuts distortion. Short heat treating cycles in small-size equipment keep costs down.

RECRUIT JOBS FOR SERVICE RETURNEES
Steady flow of college-trained technicians seek post-service jobs. Channels needed to link jobhunting GI's with prospective employers. Placement bureau set up at one Army post furnishes industry's personnel depts. with a supply of mature qualified manpower.

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CARBURIZING
Faster . . . Less distortion . . . Closer depth control . . . Selective heating . . . Reheating operation eliminated . . . No "oxygenation" of the case . . . Carburizing can easily be combined with martempering or brazing.

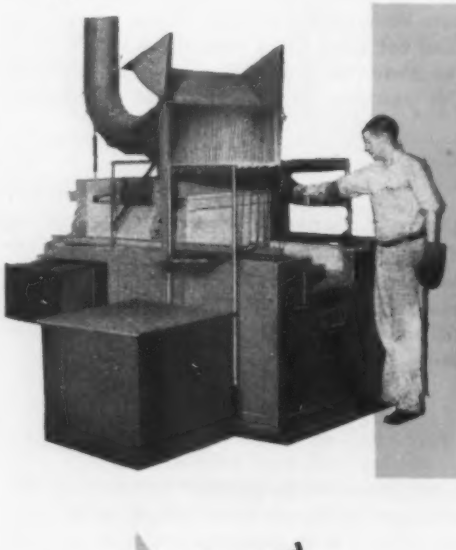
HARDENING
Complete protection of work against pitting, scaling, carburizing or decarburizing . . . Heating cycles 4 to 6 times faster . . . Low operating and maintenance costs . . . First cost of equipment materially less.

ALUMINUM HEAT TREATING
More production in less time . . . Faster, more uniform heating . . . Simplified quenching . . . Minimum warpage . . . Real protection to product by molten salt . . . Clean . . . No skilled labor needed.

PROCESS ANNEALING
No scale, decarburization or other surface effects . . . Annealing cycles reduced from hours to minutes . . . Great savings in floor space . . . 50% lower first cost of equipment.

CYANIDING
Large production in less space from smaller equipment . . . Minimum distortion . . . Higher and more uniform surface hardness of the finished product assures superior impact fatigue life.

CLEANING—DESCALING
Handles more work with less labor . . . Less floor space . . . Less time . . . Different metals and shapes can be cleaned or descaled simultaneously . . . Uniform cleaning does not affect base metal.



SAVE WITH SALT BATH HEAT TREATING!

Note these typical advantages

MARTEMPERING and AUSTEMPERING
No oil quenches required . . . Negligible distortion cuts costs by permitting machine finishing before hardening . . . Scale, decarb and quench cracks eliminated . . . Toughness and ductility are increased.

BRAZING
Work can be immersed in batches for maximum speed and economy . . . All joints brazed simultaneously in seconds . . . No decarburization of steel assemblies . . . No cooling chamber needed . . . Can be simply combined with carburizing or hardening.

GET THE FACTS!
Write today for your copy of this 72-page Ajax Salt Bath Catalog 116B — NEW EDITION.

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Associate companies: Ajax Electric Furnace Corp., Ajax Engineering Corp., Ajax Electrothermic Corp.

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Indexed in the Industrial Arts Index and the Engineering Index.

BPA NBP

Editorial:

How Not To Be A Stuffed Shirt

THERE are plenty of books which tell you how to become an executive without marrying the boss' daughter. There are courses which promise to tell you the inside story on how to be a captain of industry or commerce. But in order to cash in on any of these worthy ideas you must have what it takes in brain power and ability to work hard without feeling the strain too much.

There isn't too much information available on how to keep from becoming a stuffed shirt. Maybe you don't care whether other people think you are one or not. But at least if you try not to be one you will find that in a pinch you have friends all over the place. You will discover you can get loyalty, hard work and respect from those on your team. Here are a few simple rules that might be helpful:

Don't act as if you know all the answers to everything. You don't; everyone knows you don't and there is no use acting as though you do. It won't work. In your own line you do know the answers; your associates know you do so it isn't necessary to prove it.

Don't confuse dignity with self-centeredness. You should show a certain amount of dignity on your job but don't be pompous. That detracts from your good points and causes people to give you less credit than you deserve.

Don't lord it over your associates. That is a sign you are not sure of yourself. There is more than one way of doing this. You may unconsciously become a little patronizing. That stands out like a sore thumb, helps no one and hinders you.

When you are wrong, own up. It won't kill you. It won't take away from your position or your reputation to admit you make mistakes. Everyone does—you are no exception. To admit you are not infallible will do you worlds of good among your associates and within your own organization. Don't be wrong too often though.

Give your people plenty of rope to run with. Don't draw it tight unless your experience and intuition demand it. Give them a chance to show you what they can do. Don't pick everything they do to pieces. But don't let them run hog wild either.

These rules seem simple. But the simple things of life are the hardest to learn—and pay the biggest dividends.

Tom Campbell

EDITOR

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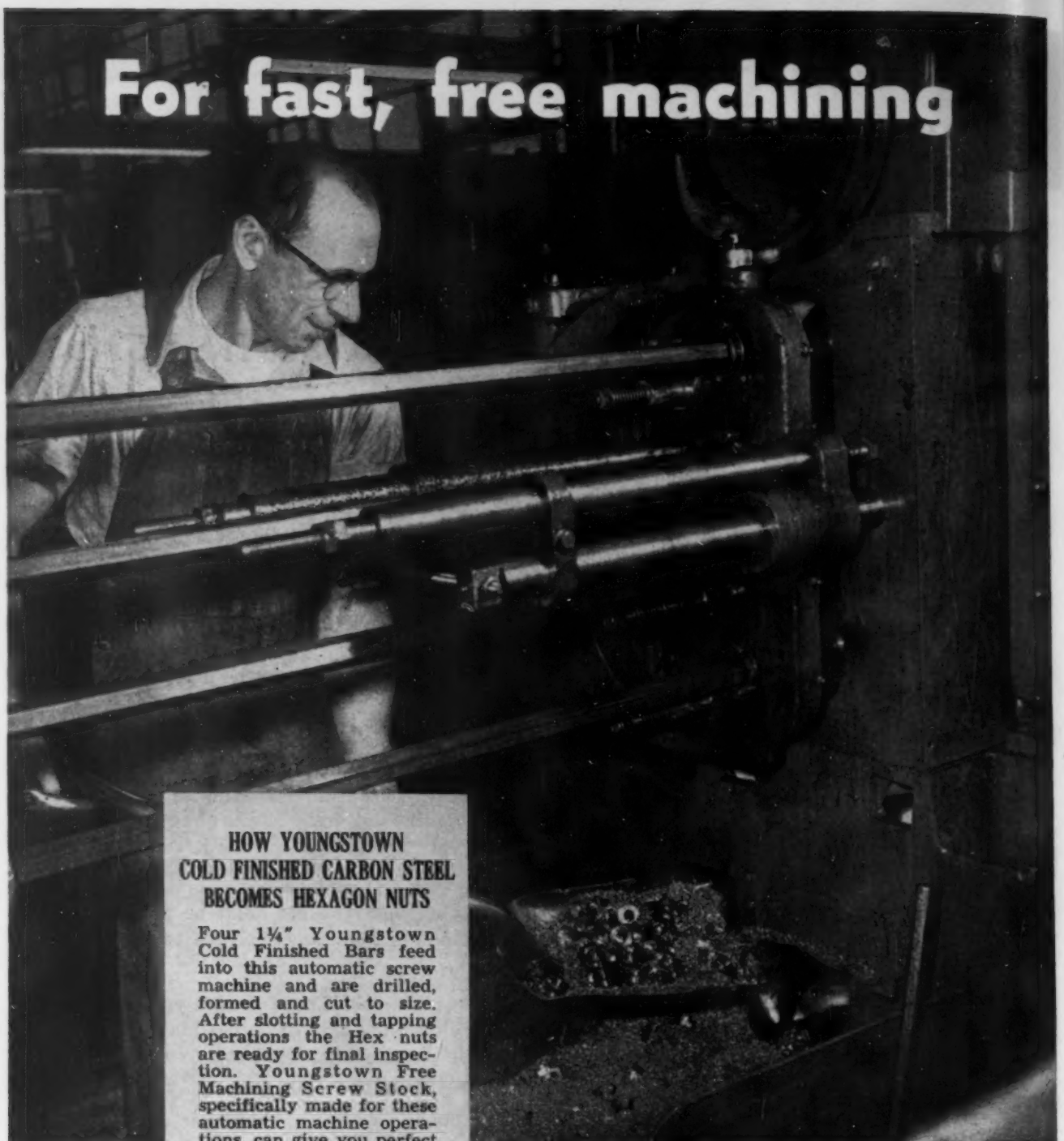
For fast, free machining



HOW YOUNGSTOWN COLD FINISHED CARBON STEEL BECOMES HEXAGON NUTS

Four 1¼" Youngstown Cold Finished Bars feed into this automatic screw machine and are drilled, formed and cut to size. After slotting and tapping operations the Hex nuts are ready for final inspection. Youngstown Free Machining Screw Stock, specifically made for these automatic machine operations, can give you perfect Hex nuts every time.

Youngstown

QUALITY · YOUNGSTOWN · SERVICE

COLD FINISHED CARBON STEEL BARS

●The free machining qualities of Youngstown Cold Finished Carbon Steel Bars begin in the melting furnaces. Here the desired chemistry is established. Rigid inspections throughout processing eliminate injurious imperfections. The result of Youngstown's never-ending quality control is a uniform, top quality product, with a wide range of screw machine applications.

THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices: Youngstown, Ohio - Export Office: 500 Fifth Avenue, New York 36, N. Y.

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - BAR SHAPES - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - RAILROAD TRACK SPIKES

dear editor:

letters from readers

Thank You

Sir:

I work for P. Sorensen Mfg. Co., Inc., of 32-31 57th St., Woodside, N. Y.

For years I have been reading your IRON AGE that has been passed from one department to the other. Our company subscribes to many trade journals but yours is the best.

I also "dig" your cartoons, especially those of Joe Buresch and the recent ones of Burson. Whoever they are, they sure know their shop stuff to be able to bring their ideas out so clearly. Let's see more of their cartoons, we usually put them on the screw machine department wall. They're good for a chuckle any day.

Thank you for your time and keep up the good work in Ye Ol' IRON AGE. *R. Agrillo, Astoria, N. Y.*

Industrial Movies

Sir:

Being producers of industrial motion pictures, we take our hats off to Ken Maxcy, Pittsburgh Steel advertising manager. His achievement in completing a 16-min black and white motion picture in one month, as reported in your July 15 issue, "Good Industrial Movie Produced on Low Budget," is indeed praiseworthy. We have known Ken Maxcy for many years—and we have a high regard for his capabilities. However, we believe that the reported price of the motion picture, $2500, may mislead others who are contemplating such undertakings.

Ken Maxcy became his own producer, he wrote his own script and he acted as director of the film—functions that are normally sought from outside services. Because of the one-month time limit and his triple responsibility, we are certain that Mr. Maxcy was able to do very little else outside of film work during that month. But the cost of Mr. Maxcy's time was not charged against the cost of his film.

Other items that constitute overhead were not charged—maintenance of the Advertising Dept., liability insurance, incidental travel expenses, electricians' and helpers' time in the mill—costs that the usual motion picture budget must underwrite.

In addition, the finished film consisted in good part of footage picked up from a previous film made for a TV program. This lowered costs in two ways: the cost of the TV film was not charged to the new motion picture and, because of its use, the amount of new film to be shot was reduced.

When these factors are considered, we think you will agree that the $2500 figure is unrealistic—that the actual cost is closer to $5000, which is still a respectably modest budget for such a production. In addition, this revised cost includes no charge for the value of Mr. Maxcy's creative ability which is not inconsiderable. Every outside producer places a value on his ability which becomes a part of his motion picture budget. *H. F. Gage, Vice President, Farrell & Gage Films, Inc., New York.*

Heart Action

Sir:

I have read with great interest your Newsfront on p. 43 of the July 29 issue and I would like to find more information about the recent scientific studies you mention about the effects of temperature and humidity on heart action. I am most interested in the question of air-conditioned rest rooms for workers' use between work periods. *G. J. O'Bomsawin, Physiological Research Div., Aluminum Co. of Canada, Ltd., Shawinigan Falls, Que.*

Contact E. I. du Pont de Nemours & Co., Wilmington, Del. for further details.—Ed.

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EASY TO OPERATE—a woman can operate it.

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MINIMUM OPERATOR FATIGUE—especially designed for use where a high rate of production must be maintained.

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DELIVERY—immediate on most models.

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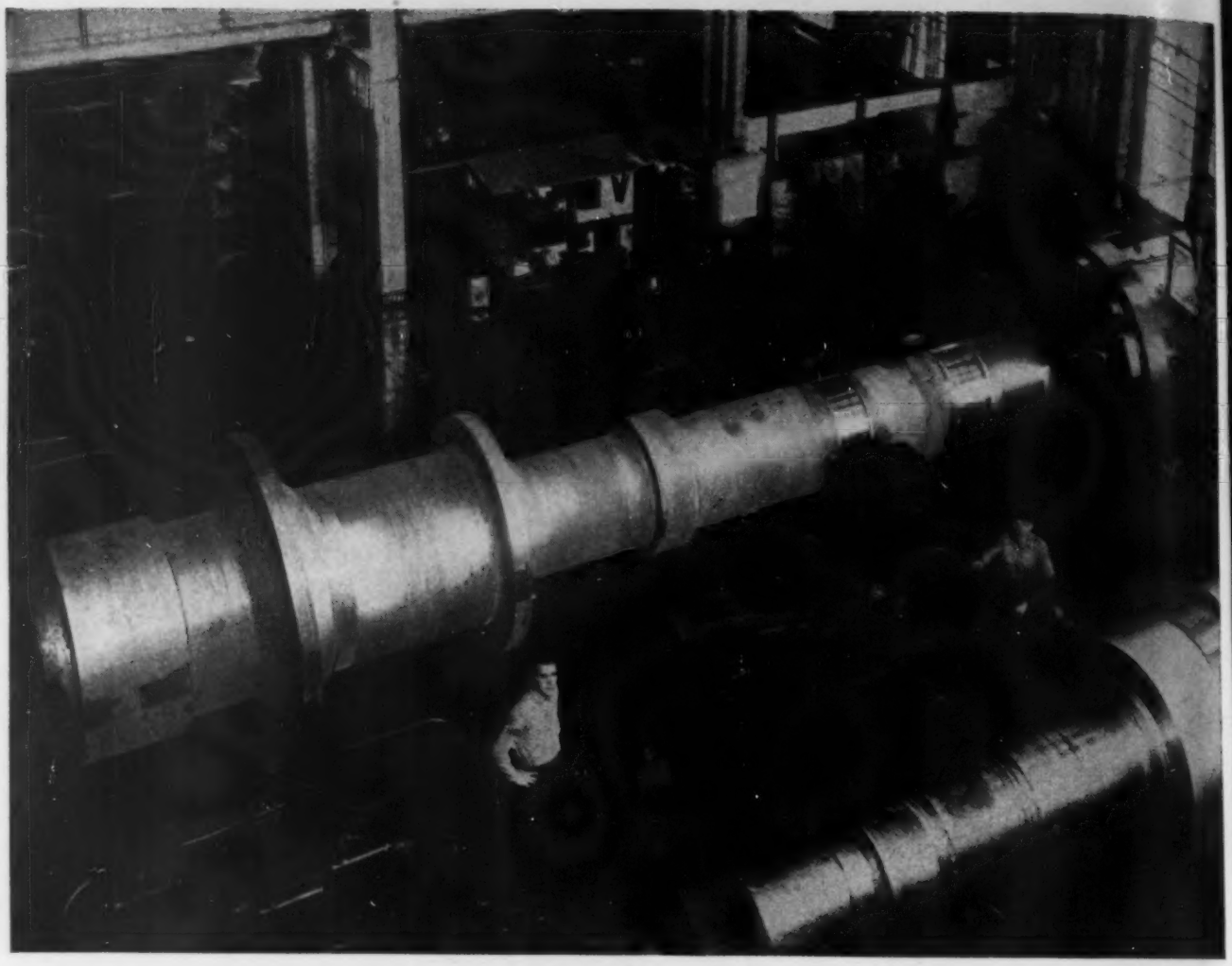

THE TURNING POINT *for a Stronger Forging*

Product —
Hydro-electric Power Shaft

Overall Length —
34′ 8½″

Body Diameter —
38½″

Flange Diameter —
96½″

Bore Diameter —
17″

. . . is not the machining of this 96-ton generator shaft, but the number of intricate forging operations performed by Midvale craftsmen. The 116″ octagon ingot, poured at Midvale for this shaft, required a 14,000-ton press to exert tremendous pressures to upset and draw it out for full strength and toughness . . . especially the large thrust collar which is 96½″ in diameter. Then after it was carefully worked to a rough shape it was put in this 100″ lathe for machining and boring.

The same skill, care and proved-practices are used by Midvale forgers in making all Midvale forgings for steam turbine shafts, generator rotors, marine reduction gears, pinions and other heavy machinery parts. Quality tests confirm this skill and experience of Midvale steelmakers every step of the way from the furnace to finishing operation.

Have your engineers and designers specify Midvale forgings engineered and made for maximum service. Whether 300 or 300,000 pounds they are noted for their toughness, long service and never-failing performance. Write, wire or phone your forging problems to us. Midvale engineers are always at your service.

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MIDVALE

FORGINGS, ROLLS, RINGS, CORROSION AND HEAT REISISTING CASTINGS

fatigue cracks

The Tin Can

The recent announcement that "Mother Wagner's*" wine would soon be available in cans brought us up with a jar. Editorially we've carefully followed developments in the tinplate line. Socially we've had no trouble getting accustomed to beer in cans. And being old fashioned about electric razors (meaning we haven't put up the dough for a new model) we still shave with soap from a can. That's traditional; we've been doing it for months. We've cleaned up the spot on the ceiling where junior cut loose with it and are quite reconciled with the little squirt.

But this wine thing; think where it can go! Last year California sold over 100 million gallons of the stuff, in bottles and jugs of course. And some canny chap has now put Old India Quinine Water into tinplate. Shades of the Kings Own Khyber Rifles! We can hear it now, "I say old chap, how about a can of quinine with a spot?" Oh well, whether the wine thing turns out to be a canny decision or an uncanny one we'll keep you posted. That is, if they don't bottle up the news.

Kudos

Now that we've begun to hear some nice things about our new format, about how it's brighter and easier to read, we feel we should tell you who designed it. Gentleman name of George Samerjan. George was one of New York's top magazine art directors before he recently opened his own studio. One reason he works for himself: He can knock off when he pleases, fly off to Europe for a couple of months and follow his real hobby, painting. He's won top awards in a host of exhibitions. *The cognoscenti* will tell you he's one to watch.

* Better check on that name. You seem to be confused with either the pie queen or the Mayor of New York.—Ed.

Exercisers Anonymous

Your regular columnist is off at an Exercisers Anonymous convention. Nice thing about their affairs is that you don't have to leave home to attend. You stay right in the hammock under the trees. Perhaps in the early morning before the heat of the day has firmed the will there may be a little (ugh!) work. But only emergency (ugh!) work—like fixing the spot where Junior went through the porch. Otherwise, just hammocking.

Platypuses

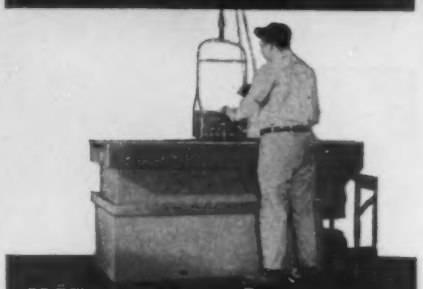
Re the July 29 puzzler we quote Firth Sterling's J. Frank Abbott: "Didn't you know? Eustace had 5 big beautiful golden top-notched duckbilled platypuses and Angus had 7 of the varmints." Others who share Mr. Abbott's algebraic accuracy: Leo D. Graboski, Vulcan Iron Works; Signe Nelson, National Lock Co.; Louise DeRoche; Eugene Witherstay, Taylor Winfield Corp.; J. E. Lee, American Mfg. Co.; Jerome J. Pottmeyere, Jr., Springfield Foundry Co.; G. Alsterlund, Chicago 45.

New Puzzler

Here's one from Charlsie (again). Always glad to have 'em. A certain company granted its office employees a 15 min break for coffee in the mornings and afternoons. One employee was extremely busy and was required to work through the whole week without taking his breaks. His hourly rate was $1.50; time and a half when he worked on Saturdays. His boss thought he should be compensated for having to work through with no breaks, and therefore decided to let him work on Saturday. How many hours would this employee have to work in order to earn enough money at time and one half to make up for the breaks he missed all week, being satisfied to make only enough to cover pay for his Saturday working time at his straight-time pay?

Do a Better Job Faster...

cut cleaning costs RIGHT DOWN THE LINE!



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WATER SEPARATOR and PUMP CHAMBER, fabricated of stainless steel, are *unitized* for easy removal in minutes.

SIMPLIFIED MAINTENANCE. Service connections, clean-out openings, and controls are located at one end of machine.

DEMAND-TYPE WATER CONTROL. Out of Metalwash research has come the improved technique of water temperature regulation for greater control and water conservation.

All types of vapor degreasers, automatic or hand operated, are available in standard and special sizes.

WHAT YOU SHOULD KNOW ABOUT *Vapor Degreasing*

METALWASH has prepared an authoritative, illustrated booklet containing a description of the theory and operation of vapor degreasers plus diagrams and cutaway photographs of the three basic types of degreasers. **Write today for your Free copy.**

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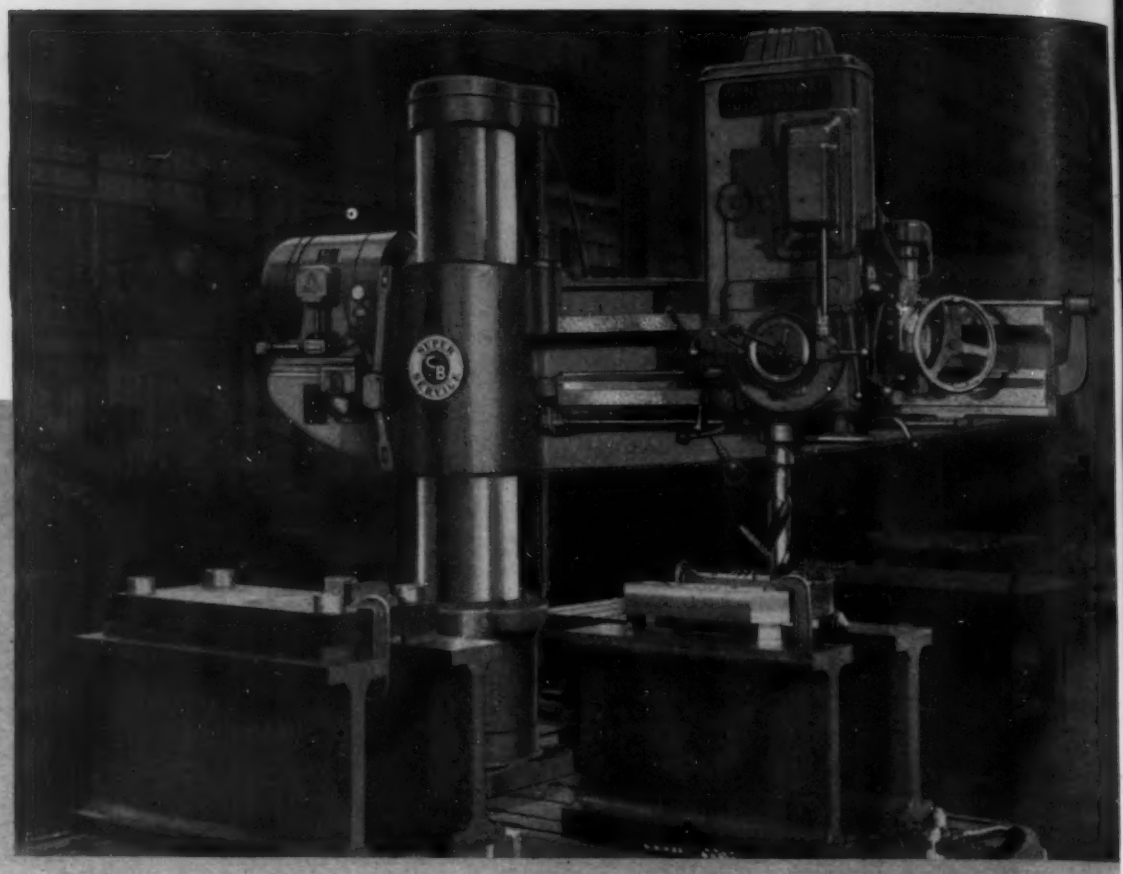
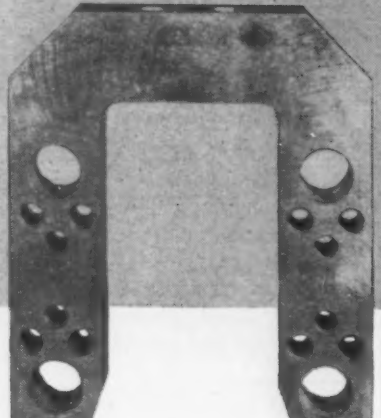


50% SAVED

IN DRILLING OPERATIONS ON

PROGRESSIVE DIES, TOOLS, JIGS, FIXTURES



The piece shown is an anvil on horn tube Pierce die.

Photos courtesy Koppy Tool & Die Company, Ferndale, Michigan

The capacity and performance of this Cincinnati Bickford Super Service Radial has effected real savings in the shop at Koppy Tool & Die Company. On the operation shown a 50% saving was effected with the installation of this new Bickford Super Service Radial. eighteen holes are being drilled from 1 27/64″ to 3″.

Write for Catalog R 29 on Super Service Radials—there's a size for your needs.

CINCINNATI BICKFORD

RADIAL AND UPRIGHT DRILLING MACHINES

THE CINCINNATI BICKFORD TOOL CO.

Cincinnati 9, Ohio, U.S.A.

The Iron Age Newsfront

Steel Wage Costs Pile Up

A medium-size alloy steel producer estimates the steel labor settlement will increase his wage costs about 11¢ per hour. He expects this figure to rise as the pattern spreads to his suppliers with consequent increase of prices. The steel union has estimated cost of the labor package at 12¢.

Plan to Expand Warning System

Included in the present Air Force plans is the establishment of 485 new radar sites. This will expand the warning system and provide additional protection against sneak attack.

Look for Smoother Riding in '55

Aiming for smoother riding qualities, several automobile producers will use torsion bar springing on 1955 models. This will be the first large-scale use of this type springing and represents an important departure from the use of leaf springs in passenger cars.

How Much Nickel Is Needed?

Recent government studies have shown the Armed Services, particularly the Air Force, have overestimated requirements for aluminum by as much as 30 pct. Now, on the strength of errors found in the aluminum study, a parallel study in nickel requirements will be undertaken. Results could have an important effect on stockpiling policy.

Develop New Magnesium Alloys

New magnesium alloys now being developed in a Bureau of Mines laboratory give promise for cold working of the light metal. Important ingredient in the new alloys is reported to be thorium. Also, new experimental high-temperature alloys being developed privately are reported to have acceptable fatigue properties at temperatures approaching 700°F. Skins for guided missiles must have 600°F resistance.

Stronger Beryllium Powder Compacts

Beryllium powder compacts with higher strength and hardness than cold worked beryllium are possible, a recent study shows. Ideal density was attained by compacting below the recrystallization temperature, at 550° to 600°C.

Refractory Castable Withstands 3000° F

A new refractory castable that can be poured, rammed or gunned into place has been developed for foundry and steel furnace use. The material is able to withstand 3000°F.

Automatic Handling Devices and Safety

Safety has improved along with production rate in plants making wide use of automatic handling equipment. Big factor here is elimination of hand loading and unloading of presses.

Hot Pressed Carbides Improved

Smoother surfaces and closer tolerances are claimed for new hot pressed tungsten carbide parts such as drawing dies, bushings, and mandrel tips. Improvements in the hot pressing techniques are reported to have cut the unit cost of these products while permitting manufacture to closer tolerances.

Skip Prebeveling and Cut Welding Cost

Fabricating methods developed by a West Coast company have eliminated the need for prebeveling on most welding jobs involving contours and shapes. A compact electric arc and compressed air torch is used for cutting and gouging metals. Torches work equally well with mild steel, stainless alloys and clad metals.

Computers Solve Design Problems

Industry is putting computers to work to solve its design problems. Typical is the use by one company to reduce the time and labor required for a transformer design to a fraction of that previously required. Both engineering time and labor are saved.

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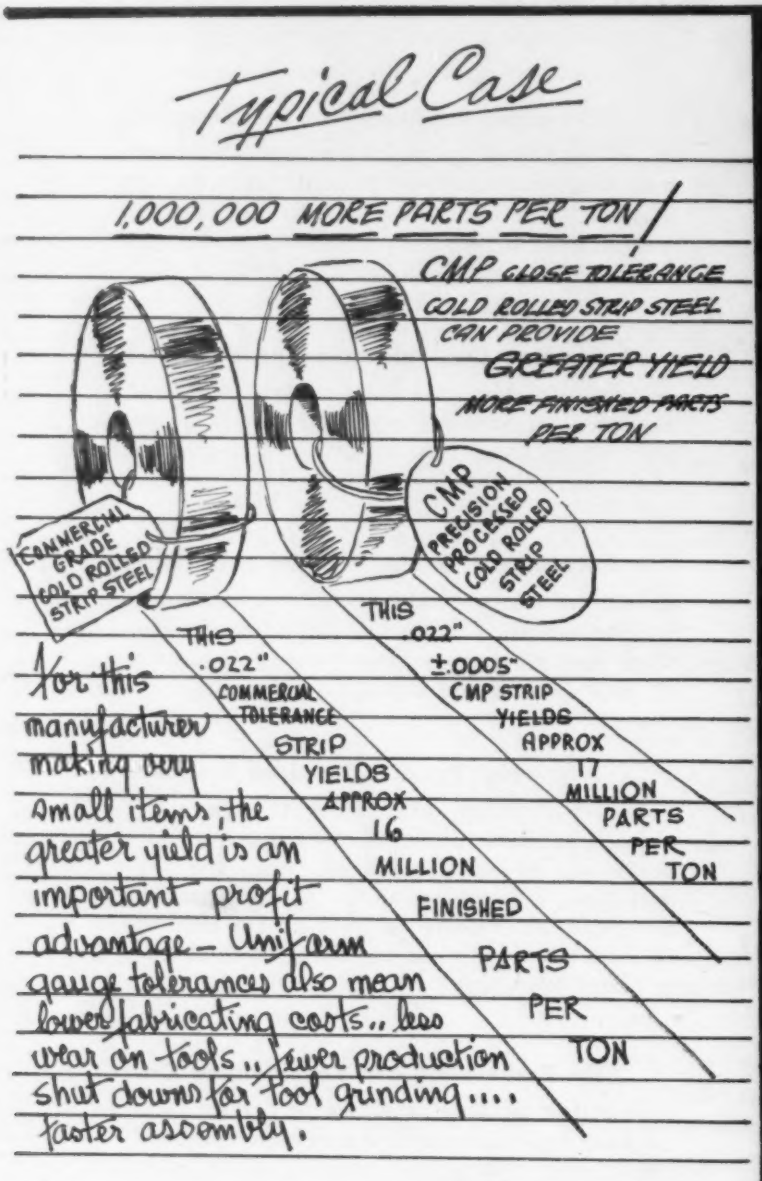
CMP COLD ROLLED STRIP STEEL OFFERS

some realistic ways . . .


Typical Case
1,000,000 MORE PARTS PER TON
CMP CLOSE TOLERANCE COLD ROLLED STRIP STEEL CAN PROVIDE GREATER YIELD MORE FINISHED PARTS PER TON
COMMERCIAL GRADE COLD ROLLED STRIP STEEL
CMP PRECISION PROCESSED COLD ROLLED STRIP STEEL
THIS .022" COMMERCIAL TOLERANCE STRIP YIELDS APPROX 16 MILLION FINISHED PARTS PER TON
THIS .022" ±.0005" CMP STRIP YIELDS APPROX 17 MILLION PARTS PER TON
For this manufacturer making very small items, the greater yield is an important profit advantage – Uniform gauge tolerances also mean lower fabricating costs.. less wear on tools.. fewer production shut downs for tool grinding.... faster assembly.

TO REDUCE END-PRODUCT COSTS THROUGH PRECISION GAUGE TOLERANCES

CMP's precision rolling process permits production of cold-rolled strip steel as thin as .001" to split-hair across-the-width gauge tolerances not obtainable by other rolling methods. This unique precision is reflected in less square footage loss through oversize variation, less wear on tools, fewer rejections and faster assembly where close fitting is encountered.

CMP processes also permit close control of physical characteristics to develop the combination of physicals best suited to fabricating and service requirements of the application.

We'll be happy to work with you to develop specifications and processing methods to enable you to make the best possible product at the lowest possible cost.

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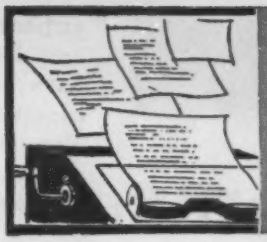


NEWS SECTION

Special Report

What's Ahead for Air Conditioning?

Maturing industry is still bothered by growing pains . . . Cool weather in early summer slowed season's sales . . . Inadequate home wiring hurts, too . . . But units are better and growth is assured—By G. G. Carr.

♦ AIR CONDITIONING has come of age, but it's still plagued by pesky growing pains. And many of them are the fault of the environment rather than the industry itself.

Immediate problem is that cool weather at the beginning of the summer chilled room air conditioner sales somewhat. Manufacturers had been hoping for bigger and better things this year, but it now looks as if they'll do well to exceed even slightly last year's business. But '53 was the best year yet for the industry. Price cuts, unloading of inventories seem definitely in the cards.

Enters Lower Priced Field

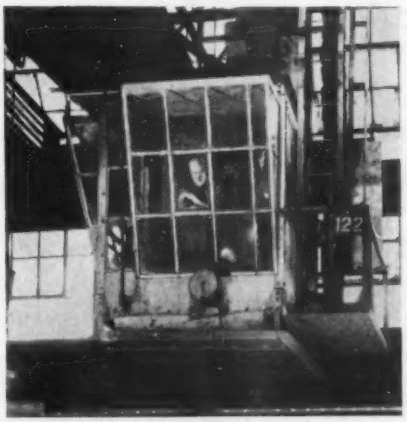
Central cooling units, which cool a whole building, have continued to sell well in '54. In fact, says George S. Jones, Jr., managing director, Air-conditioning & Refrigeration Institute, scarcely an office, hotel or large public building is now being built in the United States without air conditioning.

And central units are becoming more popular for homes too. In 1947 only 1400 homeowners could boast central cooling. Today well over 45,000 homes have such units. Nearly a quarter of all homes now being built in the $15,000-$18,000 class are centrally air conditioned. National Assn. of Home Builders is now pushing for central units in the $10,000-$12,000 class. And even a few prefabs sport built-in cooling.

But there is a bad hot spot in the cooling picture. Wiring in many if not most of the nation's existing buildings just isn't heavy enough to carry the load pulled by air conditioners. This creeping obsolesence of electrical wiring has been worrying utilities and appliance makers for some time; air conditioning has brought it to a boil.

You've probably noticed the full-page ads and articles on adequate wiring in national magazines. Part of a major campaign by electrical equipment makers, they're skillfully done, have considerable reader impact, particularly for a relatively complex subject.

But rewiring is still a costly job, and pressures must be considerable before many property owners, particularly homeowners, will consider it. (But many office and hotel operators have been forced to it.) Air conditioners have been reluctant to market 220-volt units, fearing that cost of running in special lines would frighten customers. (They point out that a 220-v line for a kitchen range is quite different from a line to an upstairs bedroom.) But many feel the heavier lines are inevitable. More and more units are expected to carry a 220-v nameplate.



WORKING DIRECTLY over heat-treating ovens at Taylor Forge & Pipe Works, Cicero, Ill., this crane cab is subject to heat up to 1100°F. Dravo Corp. crane cab conditioning keeps cab temperature at 75°-85°F, provides continuous change of air, keeps fumes, dirt, dust, odor from cab.

Improving Performance

The weather man has been another source of aggravation to air conditioners. Nobody doubts that cool weather in late spring and early summer took the bloom off what should have been a new record year for air conditioners. It has been almost axiomatic that anyone who hadn't bought an air conditioner by late July would probably grin and bear it "for this year anyway."

The industry has an answer, and a good one. But it's admittedly tricky to put across. Air conditioners point out that a modern unit is far more than a fan and a refrigerant coil. Today's units clean and dehumidify air, maintain temperatures at steady levels, in addition to cooling.

Nobody denies that there are health and psychological values inherent in air conditioning, apart from the comfort factor. But just how important these factors are has so far been pretty much a matter of opinion.

Growing In Industry

Now however, a major study by Dr. L. A. Brouha, head, Physiology Div., Haskell Laboratory, E. I. du

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SPECIAL REPORT

Pont de Nemours & Co., spells out with facts and figures just how air conditioned rest areas in factories boost worker productivity. The air conditioned openhearth shop is still a long ways off, but Dr. Brouha's study points up the value of short "breaks" in cooled rest areas.

For Dr. Brouha's report on his study of air conditioning as a boost to productivity, turn to p. 125 of this issue.—Ed.

Meanwhile labor unions are asking that air conditioned work areas be written into contracts. So far most of these contracts have understandably been written in the South and Southwest, but there's little doubt the practice will spread.

Health benefits of air conditioned homes are being investigated in a housing development outside Austin, Tex. Sponsored by National Assn. of Home Builders, in cooperation with air conditioner makers the development has 22 homes each equipped with a different make 2-ton central cooling system. One phase of the project consists of checks by University of Texas scientists on the effects, both physiological and psychological, of air conditioning.

Facts Needed

The 2-ton units were chosen for the Austin project as the optimum in terms of cost and efficiency.

And the project may have considerable effect on the looks of the next house you buy. One of the major problems being investigated is what architects and builders can do to increase air conditioning efficiency — where should overhangs be placed? . . . how about windows? . . . how important is location of house and plot? . . . plus a host of other design and construction factors, so far done mostly by guesswork or at best rule of thumb.

In the meantime, watch for more emphasis on combination cooling and heating units. A few firms have already marketed room air conditioners with built-in heating elements, but the industry has its eye on bigger and better moves in that direction. And the reason is a curious chicken-egg situation.

Builds Power Peaks

Growth of air conditioning has meant increasingly frequent summer peak loads at generating stations, particularly in the South. This means that utilities have excess generating capacity in winter, capacity which they would naturally like to turn into dollars.

So far, electric power companies, with some notable exceptions, have not been too actively pushing air conditioning. And they've been downright chary of central electric heating. Demand has been uncertain, until recently not heavy enough to warrant investment in additional generating capacity. And to refuse service to underwired buildings could backfire nastily.

THE IRON AGE

But the American public decided it would be cool in summer, enjoy television, do more and more cooking by electricity. Result: Utilities, willy-nilly, have been forced to boost power capacity. And with summer peak loads moving north at a good clip, they are increasingly recognizing that a feasible plan for year-round electric air conditioning is just a matter of time. Air conditioners are watching, waiting with slide rules poised.

Appliances:

See better market than was expected during '54.

Market for hardware and appliances may be even better than originally hoped for this year as a result of the progressively expanding construction industry and a government plan to "nudge" the economy into a higher rate of spending.

Government officials, after reviewing June construction figures when 120,000 homes were started, now estimate that more than 1 million homes will be built this year. June's starts were 12 pct above May, although building traditionally falls off in June.

See Favorable Signs

Operation "nudge"—designed to make sure the economy takes an upward turn this fall—calls for a speed up in government purchasing so that orders which would normally be placed later will be sent out right away, thus bolstering production and employment.

Other favorable business signs noted in Washington: the continuing baby boom, with its resultant increase in demand for labor saving devices and "do-it-yourself" goods; expanded social security and pension plans; higher income, lower taxes.

One result of today's income pattern, however, is that many people no longer must spend all their income, which means that smarter advertising, sales promotion and training are needed to take advantage of the buying potential.

ECONOMY: Ike Sees Pickup

In reviewing economy at halfway mark, Ike sees signs better times are coming . . . President warns against excessive pessimism . . . '54 ahead of '53 pace—By *R. M. Stroupe.*

♦ CONFIDENCE that the U. S. economy is gathering strength for an impressive expansion is clearly seen in President Eisenhower's new evaluation of commercial and industrial trends (See p. 93).

At the halfway point in 1954, the President says, there are many signs of better times coming.

Inventories, slowly whittled down during the late winter and spring, were showing an improved relationship to sales. Gains were being made by retail merchants.

Now, well into the third quarter, private outlays for capital expansion and plant improvement are being made at a rapid pace. Construction appears to be headed for a new high mark. Strength is seen in the financial markets.

Industrial Output Off 8 Pct

Weighing these factors, most of them previously discussed piecemeal by such agencies as the Treasury and Commerce Depts., Mr. Eisenhower observes that American economic welfare may not merely be healthy, but is actually improving.

Not in every area, the President concedes, is there a basis for satisfaction. He points out a depressed state of factory employment and a rate of manufacturing and mining production that was down 8 pct in the half year, compared with the 1953 figure.

There is danger of excessive pessimism, Mr. Eisenhower cautions, in assuming that the country is in an economic decline merely because all records of peak year 1953 are not being matched or exceeded.

In some instances, he notes, there was an actual upswing in the first 6 months, when considered against the corresponding period last year. While gross national product and non-farm employment were lower by 2.7 and 2.6 pct, respectively, these gains were made:

Personal income	up 0.2 pct
Disposable personal income	up 1.4 pct
Bank debits outside New York City	up 0.9 pct

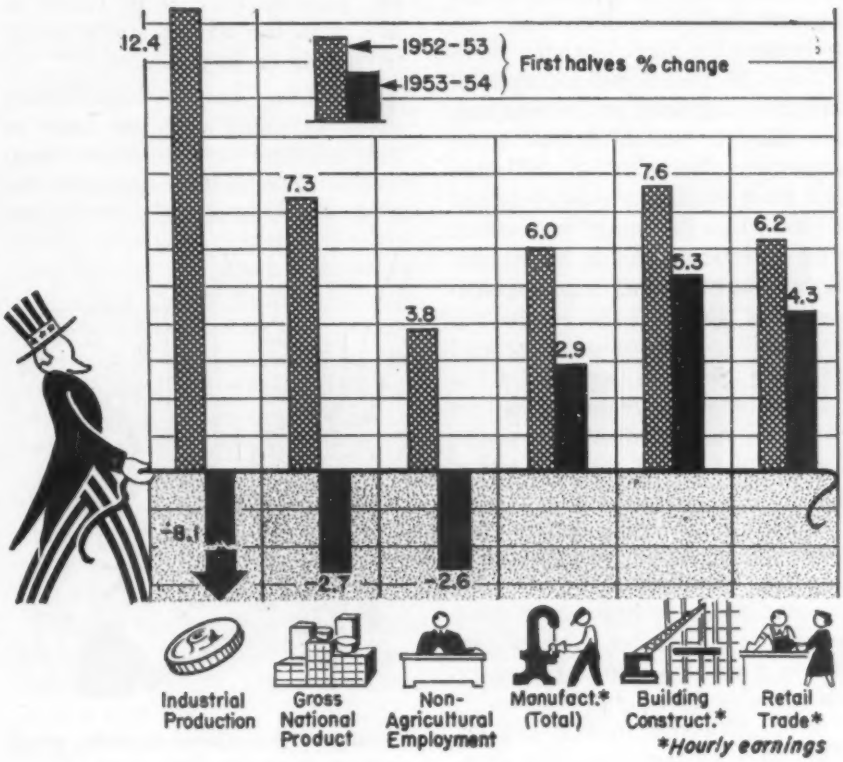
When 1954 is compared with 1952, the last year before the Eisenhower Administration took office, the present year looks even better. In each case, figures for first half '54 show advances:

Industrial production	up 3.3 pct
Gross National product	up 4.4 pct
Nonagricultural employment	up 1.1 pct
Personal income	up 7.2 pct
Disposable personal income	up 8.8 pct
Per capita personal income	up 5.3 pct
Bank debits outside New York City	up 10.2 pct

The sum of these factors, in the view of Mr. Eisenhower and his economic advisers, is a solid level of business activity capable of supporting continued growth. With the application of knowledge, judgment, and concern for the public, the President says, the nation will have assurance of a better future.

The President's report pointed out that since 1952 was the best year before the Eisenhower Administration took over, economic activity of late has been higher than at any time before the current Administration moved into office. And the report adds that since 1953 was a still better year than 1954 it follows that the overall performance of the economy during the present Administration has been better than at any earlier time.

How Bad Has the Recession Been?



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PENSIONS: Survey Foundries

Retirement plans commonest in 200-500-worker plants, reports National Foundry Assn . . . Most have 15-year eligibility period . . . Stress age less—By K. W. Bennett.

◆ PENSION PLANS in foundries? When National Foundry Assn. discovered operating pension arrangements in 256 of 1052 foundries queried last year, the association sought to dig deeper, find what makes the plans tick, and how much they cost.

Ignoring the large captive foundries (106 of the total 256), the association last week reported finding pensioning commonest among producers having 200 to 500 employees, though five companies having less than 50 employees reported. In most cases, a 15-year waiting period was standard for the employee to become eligible, though this might range from a low 1 year in one case to 25 years of service.

Age Is Optional

A little less than half had a minimum age requirement of 65 for eligibility, but a slightly larger segment had no minimum age requirement for participation.

Most of the foundries checked had no compulsory retirement age, but almost two-thirds of those answering the question indicated that their particular plan contained a provision for early retirement with a reduced pension, if the employee desired. And a strong majority of those foundries having a disability pension arrangement required 15 years service. Of a total 88 foundries reporting on this point, 23 had no disability provisions, and 4 didn't indicate either way.

A healthy majority of foundry pension plans make employees over the age requirement eligible for the plan at its inception, and most companies use either years-of-service as a pension payment base, or use a Social Security offset plan.

Most foundries having pension plans have set them up under trustees (rather than group annuity contracts or individual policies) and most often these trusteed plans are administered by a bank or trust company.

The history of the individual plans suggests that the movement gained strength for the first time in 1950, did fairly well in 1951 and 1952, and fell sharply with the general level of foundry business in 1953. Of the 78 companies replying to the question "Did your plan result from collective bargaining with the union," 53 said yes, and 32 reported keeping their pension plan separate from the labor agreement, 20 indicated they included the pension provision in their regular labor contract.

A heavy majority of the foundries questioned indicated their pension plans are non-contributory, with cost to the company in cents per hour ranging from 1¢ up to 10¢, with the largest single group paying 6¢ to 7¢ per hour.

Foundries having contributory plans indicated cost per hour to the employer of anywhere from 1.5¢ to 17.0¢, costs to the employee of 3.0¢ per hour up to 11.0¢ per hour. Employee's contribution ranged from 10 pct of the total up to 50 pct, with the median somewhere around 30 pct of the total cost per hour.

That's how the plans work. But judging by the pace of competition, foundrymen were working too hard at selling their product to have much time for the study of new plans. Costs continue to be a problem, pricing is stiffly competitive.

How Foundries Fund Pensions

Method	No. of Companies
Group Annuity Contract	15
Deposit Administration Contract	8
Individual Policies	6
Trusteed Plan	42
Pay-As-You-Go Plan	7

"That must have been a pretty good suggestion young Jones made."

Strikes:

NLRB prohibits strikes before contract runs out.

Protection for the employer whose workers strike before the termination or alteration date of a working agreement is conveyed in a new National Labor Relations Board ruling.

This ruling, made by a three-man majority of the board, prohibits union strikes over contract demands except when the contract, by its own terms, is subject to either change or a final ending.

As a result, the employer is not obligated to put back on the payroll those workers who strike at any other time.

Had Allowed Strike Anytime

Under this new interpretation of the Taft-Hartley Act, the expiration date is the date on which a contract is or can be ended, or is subject to change. If the agreement is for an indefinite time, the union's 60-day notice of a wish to change or end it fixes the expiration date.

Until this ruling was made, NLRB had allowed a strike at any time in the life of a contract, provided the union observed a 60-day "cooling-off" period after giving notice of new contract demands.

ELECTIONEERING, Studebaker officials (left to right) Paul G. Hoffman, board chairman, Harold S. Vance, president, and Paul M. Clark, vice-president, industrial relations, appeared on television last week to plead company's side prior to Studebaker workers' vote on wage cut.

UAW: Studie Vote Historic

Union consent to pay cut ends precedent-setting case . . . Wages still top Big Three . . . Cost-plus, postwar demand upped wage costs . . . Still work to do—*By R. D. Raddant.*

♦ A ROUSING 8 to 1 vote by Studebaker workers to take a 14 pct pay cut and submit to other contract modifications put an end to a historic case in automotive labor relations.

The affirmative vote staved off a 60-day notice of contract termination and the threat of actual closing up of the 102-year-old corporation on the eve of a merger with Packard. (THE IRON AGE was assured that enough proxies were in the bag to assure the merger when proxies were added up Tuesday.)

Union Changes Mind

The factual details are familiar. The faltering independent, as part of a companywide economy program, asked its union, Local 5, UAW-CIO to take a pay cut and accept other contract modifications. Intent was to put Studebaker's excessive labor costs on a par with the industry.

After a union rejection at a mass meeting, Studebaker filed a 60-day notice of contract termination and actually threatened to cease operations if the contract was not modified. Union membership, urged by its officers, asked a reconsideration. On a secret ballot the union approved contract changes by a vote of 5371 to 626.

Cost-Plus Hurt

Although Studebaker had always been known for model relationship with its local, it was a surprise to many to realize that wages and benefits far exceeded those of the Big Three. Contract loopholes also made it possible for costly abuses to creep into the plant.

A lot of Studebaker's problems can be traced to the familiar words "cost plus." During the war and postwar periods, cost-plus contracts provided little incentive for efficient operations and led to wage and standards concessions.

The postwar car demand made it difficult for any company to be tough on wage negotiations. However, the Big Three, notably General Motors, held closer to the line. It is recalled that in the 113-day strike in 1945-46, GM held out for an entire month over a single cent, because it refused to budge ahead of the national pattern.

Studebaker officials deny that their labor relations policy was the result of expediency. They had hoped that through a model relationship between company and union, a solid incentive to full production and company loyalty could be established.

Abuse Seniority

Throughout these years, union officers have tried to bolster these principles. In fact, officers from the international union in Detroit have on occasion urged Studebaker workers to follow through. There is a lot of evidence that Studebaker, in a reverse twist to the conventional attitude, feels it was injured not by union leadership, but by union membership.

One of the most serious abuses that developed at Studebaker was "bumping," a means by which workers with high seniority used transfer privileges excessively. This cost the company $789,000 in the first 4 months of 1954 alone. Seniority will still be recognized in the new contract, but will not be permitted to reach the extremes that prevailed.

In a surprise to many outsiders, Studebaker will continue to grant 43 minutes "personal time," compared to about 24 minutes industry average. Studebaker also had higher shift and holiday premiums than existed outside the industry and its high wage rates were pushed up by piecework and other incentives.

Still Pay More

Even after the modifications, Studebaker workers will get a higher rate than the Big Three. A drill press operator at Studebaker will get an hourly rate of $2.055 compared to $1.95 at GM, $1.955 at Ford, and $1.98 at Chrysler.

While joy prevails at South Bend, Studebaker appears to have a lot of work to do before it regains its sound position. First half losses reached $8,925,800 in spite of a tax recovery of $10,290,000.

Furthermore, the new company, assuming the merger passes, will have a lot of reorganization work ahead.

UNIVERSITY OF MICHIGAN LIBRARIES

How to Avoid His Costly Mistake!

He bought a special gage for a job a Federal Modified Gage could do!

He's not alone! There are too many other gage buyers who mistake something *new* for something *better* . . . and get involved in needless expense and grief.

Who's to blame? When gage buyers follow fads, instead of shopping the field first, it's usually because they haven't the time to investigate. They haven't time, for example, to evaluate each of the 30,000 Federal gage designs in terms of their particular problem. So, they believe a new job calls for a new gage.

Even the largest firms are victims. One of the mass-production leaders bought the latest thing in fancy gages only to learn their accuracy could not be maintained. Now, Federal gages are back on that job.

It's easy to be sure! Call in your nearby Federal sales engineer. He is backed by thousands of Federal gage designs and can give unbiased advice about air, dial indicating, electric or electronic gages . . . because Federal makes them all. If your dimensional control problem calls for a new gage design, he can quote the costs, for most Federal *catalog or modified* gages were *once* customers' specials. Why not talk with Federal soon?

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Merger:

Sale of Follansbee, merger deal to be decided.

Stockholders of Follansbee Steel Corp. will meet late this year, probably in November, to vote on a $9 million offer for the company's assets, and a proposed merger with two non-steel companies.

Climaxing several weeks of speculation following an announcement that "substantial interests" were negotiating with the company, Marcus A. Follansbee, president, revealed that the purchase offer had been made by a group headed by Frederick W. Richmond, of New York.

At the same time, Mr. Follansbee said company directors have approved a merger agreement with the Clint W. Murchison interests of Dallas, Tex. Under this agreement Murchison's Consumers Co. of Chicago, and the Frontier Chemical Co. of Wichita, Kan., and Denver City, Tex., would merge into the corporate shell of Follansbee.

Mr. Follansbee said his firm would be the continuing company under a new name.

MISSILE SCIENTIST Dr. Ernst H. Krause, will head new $10 million research laboratories planned by Missile Systems Div., Lockheed Aircraft Corp., Van Nuys, Calif. Dr. Krause has been associate research director at Naval Research Laboratory, Washington.

REFRACTORIES: Expect Upturn

Producers expect an upturn in refractories sales beginning in third quarter . . . Rugged competition has caused price cutting by smaller firms—By J. B. Delaney.

♦ LIKE their biggest customer, the steel industry, refractories producers think their "recession" has hit bottom and that third quarter will show an upward trend in sales and production.

Admittedly, this attitude of hopeful optimism is based largely on predictions that steel business will begin to pick up in September and thus stimulate demand for refractories. Some companies note that sales in the past month are up 10-15 pct and that a further increase is in the cards. Producers say consumer inventories are down to a working level which will work in their favor when a turn for the better materializes.

The consensus is that 1954 will be a poor year in relation to 1953 and record-breaking 1951, when sales totaled $324.4 million and $326.8 million, respectively.

Won't Meet Price Cuts

Harbison-Walker, the largest producer, reported net sales in first 6 months of 1954 at $28.2 million compared with $40.5 million in the same period of 1953, a decline of 30 pct. Net income was $1.5 million compared with $2.9 million, a drop of 47 pct. For the 3 months ended June 30, sales were $12.7 million compared with $20 million in the same period last year and net income was $396,871 compared with $1.3 million in 1953.

This has been a year of stiff competition and growing emphasis on quality and delivery. Some marginal plants have been shut down; others placed on short work weeks. Absorption of freight to meet competition is commonplace. Production is being concentrated in new, highly-mechanized plants.

There has even been some price-cutting by medium-size and small companies. Consumers say they can get price concessions by shopping around. This type of competition has cost the larger, more stable companies some business but they have steadfastly refused to meet it.

As one large producer put it: "Cutting prices is ridiculous and senseless, particularly since there are only so many pounds of refractories used."

Furthermore, the industry now is confronted with the necessity of increasing prices to offset higher wage costs. The companies have settled with various unions that represent industry workers on the basis of a wage pattern following that established by the steel industry—5¢ an hr on wages, plus fringes.

Inventories Slashed

Heavy customer inventories, particularly among the steel companies, have been the biggest problem the industry has had to contend with. As a result, sales have been off to a greater extent than the operating rate of the steel industry, for example, would indicate.

One large producer estimates his gross production is off 50 pct from 1953. He points out that steel companies have standardized on a maximum inventory of 30 days compared with 90 days in 1950. A large steel producer estimates his purchases are off about 45 pct. His overall inventory is 30 days, although a 45-day supply of silica roof brick is maintained. On the other hand some special shapes are held to 20-30 day supply, and mill brick inventory is under 20 days. Some steel companies have shipped material from one mill to another rather than place new orders as they strived to bring inventories under control.

One of the results of this low-inventory policy of steel producers is that the refractories companies are now forced to maintain large stocks to be in position to deliver promptly. For this reason some of the newer refractories plants have much larger storage areas than in the older units.

Steel Uses Most

An aid to the steel producers in the present market is the promptness of truck deliveries. On standard shapes and sizes they can have the material in their plants the same day they order it.

Sales for both openhearth and blast furnace use are down, although openhearth consumption is hardest hit. Mill brick sales also are suffering. Electric furnace consumption is off sharply, but producers are encouraged by a recent pickup in this market.

The steel and iron industries account for nearly 60 pct of refractory sales. Non-ferrous metals consume about 7 pct. In the nonferrous field, copper and zinc market has been on a par with that of steel and iron, but demand from aluminum producers has been good. The glass market is firm, and demand from the cement industry is very good.

Value of Refractories Shipments

(Thousands of Dollars)

Year	Total	Clay Refractories	Nonclay Refractories
1953	$324,367	$159,663	$164,704
1952	300,246	161,092	139,154
1951	326,842	171,086	155,756
1050	238,657	126,686	111,971
1949	184,171	102,144	82,027

Source: Facts for Industry, U. S. Bureau of the Census.

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THE LONG VIEW

on the buying and leasing of industrial equipment

JONES & LAMSON'S 3-WAY MARKETING SERVICE

To further facilitate the expansion of American productivity and markets, Jones & Lamson now offers *three* plans for the procurement of machine tools.

They are designed to accommodate the widest possible variety of industrial needs, and to establish top industry standards for sound practice.

Outright Purchase

The outright purchase of capital equipment is generally preferred. It offers the obvious advantages to the user of lower cost, freedom of operation, and full profit from the use of the equipment.

"Pay-from-Productivity" Plan

Plans are also offered for those who prefer making payments from the additional savings created by the use of new and modern machine tools, and on terms more favorable than can be obtained from most credit sources.

Payments may be made on a one to five year basis, in equal monthly installments, with a small down payment and a charge at the rate of 3.25 percent on the original unpaid balance.

(Payment Analysis per $1,000. Sixty Equal Monthly Payments)

	Remaining Principal	Total Payment During Year	Total Cumulative Payments
Payment at Shipment	—	—	250.00
End of 1st year	600.00	190.89	440.89
End of 2nd year	450.00	181.89	622.78
End of 3rd year	300.00	172.89	795.67
End of 4th year	150.00	163.89	959.56
End of 5th year	None	154.89	1,114.45

The Lease Plan

Leasing may be advantageous when working capital is inadequate for necessary plant modernization or expansion, and when alternative uses of capital are more pressing or more profitable.

Under the Jones & Lamson plan, the customer gets the normal 1 year guarantee, and he may offer to buy the machine at the end of any year, at the then existing fair market value or at a predetermined option price.

To provide maximum flexibility, the plan is available in four variations, the principal differences being in the annual rental and return charges. With each plan, a 10 percent deposit is required, to be refunded to customers upon fulfillment of transaction. The minimum payment plan is shown below.

(Annual Rental per $1,000 Selling Price)

Year	Rent	Return Charge
1st	$180	$500
2nd	180	360
3rd	180	240
4th	180	120
5th	180	None
6th	180	None
7th	60	None
8th	60	None
9th	60	None

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STEEL: Check Inventories

Some of industry's best minds trying to estimate consumers stocks . . . consumption estimated 10 pct higher than shipments . . . Upturn predicted—By J. B. Delaney.

♦ SOME of the best minds in the steel industry have been concentrating on the problem of steel inventories in the hands of consumers. But the answer continues to elude them.

A good indication of producer uncertainty on consumer inventories is the way the predicted upturn in steel demand has been postponed from month-to-month.

The mills are certain of one thing: their customers have been consuming more steel than they have been buying. One source estimates that in the first 7 months of 1954 consumption exceeded shipments by 10 pct.

Additional proof that inventories are down is the number of last-minute rush orders from consumers. Warehouses are benefiting from this through orders from users who normally buy in mill quantities. What happens is this: The consumer needs certain sizes and shapes in a hurry; he cannot get shipment from the mill quickly enough. So he falls back on the warehouse for his limited requirements.

Need Better Gages

But that's as far as it goes. No one knows for sure whether inventories generally have yet reached rock bottom, although there is evidence they have in some specific cases. They feel that this is the case, and some analysts are inclined to believe that users may have overdone it, that the unwary may find themselves behind the eight ball when the trend reverses itself.

The main difficulty confronting the inventory analysts has been lack of experience in a so-called "normal" market. They have no bench marks to show them the way. So they have been trying to do their jobs more or less by ear. Their one consolation is that they are piling up experience today that will guide them in the future.

Compounding the problem has been uncertanty of consumers themselves. When the present buyers' market began to take shape, steel customers studied their inventories and decided they could reduce them to a certain level. But as their own sales and production declined, they revised their inventory ideas downward.

Other factors are both psychological and material. When the consumer knows he can obtain quick delivery he's inclined to work on a corresponding hand-to-mouth basis. Also, he figures he can reduce his own costs by shifting the inventory burden onto the producer.

Underestimated Vacations

The producers also underestimated the effect of consumer plant vacations. They thought the vacation shutdown period would be over in July; they were caught flatfooted when it was extended into August. For this reason the same sales executives who were predicting that July would be the low point now believe that August might be the rock bottom.

Nevertheless, most steel sales offices are convinced that the uptrend will begin to show itself in late August or early September. Their predictions are bolstered by President Eisenhower's mid-year economic report to the effect that the recent decline has been halted and that the national economy is in good shape.

Amplifies Spiral

When the turn comes, the steel companies feel that the same psychological factors that worked against them on the downward spiral will act as a stimulant to sales and snowball to keep the orders coming.

For example, let's assume our steel friend is right when he estimates that consumption has been exceeding shipments by 10 pct. Once inventory has been reduced to rock bottom, buying will have to go up at least 10 pct—just to support current manufacturing activity. Any increase in business of steel users would raise demand that much more. In addition, the same inventory in terms of tons would then be shorter in terms of days.

Once deliveries become extended by as much as one additional week, the producers believe, customers will move to protect themselves by getting their orders on the books. This will further extend deliveries and demand will rise.

Fabricated Structural Steel

Contracts, Shipments, Backlog

	Estimated Net Tons		
	1954	1953	Avg. 1947-50
CONTRACTS CLOSED			
June	219,306	232,441	196,725
Year to Date	1,241,534	1,555,318	1,086,365
SHIPMENTS			
June	290,262	274,587	182,851
Year to Date	1,621,793	1,560,470	1,103,515
BACKLOG	1,390,613	2,152,764	1,214,511

Source: American Institute of Steel Construction

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producers of the world's first successful rotary air tools

Steel:

U. S. Steel revises base export prices.

The following revisions in its list of published export base prices were announced by U. S. Steel Export Co. last week. The new prices were effective with shipments from mills on Aug. 10, 1954, and include freight to New York, Philadelphia and Baltimore. Other items in its published list remain unchanged. Extras apply.

CARBON STEELS	$ Per Net Ton
Blooms, Billets and Slabs	
rerolling	72.00
forging	85.50
Tube rounds	104.00
Light rails	113.70
Structural shapes	94.00
C. B. sections, bearing piles	94.00
Plates	92.60
Floor plates	113.60
Sheet piling	109.60
Hot-rolled bars	95.00
Cold-finished bars	116.80
Vitrenamel sheets, 12 ga.	120.60
Electrical sheets	190.00
Galvanized sheets	113.40
Hot-rolled strip	87.00
Cold-rolled strip	123.80
Tight cooperage hoops	98.00
ALLOY STEELS	
Blooms, billets & slabs	94.00
Hot-rolled bars	104.40
Plates	124.00
Structural shapes	112.00
Hot-rolled strip	142.60
Cold-finished bars	135.40
HIGH STRENGTH STEELS	
USS MAN-TEN	
Hot-rolled bars	110.00
Plates	113.60
Structural shapes	113.00
C. B. sections	113.00
USS COR-TEN	
Hot-rolled bars	137.00
Plates	137.00
Structural shapes	136.00
C. B. sections	136.00
Hot-rolled sheets	130.00
Cold-rolled sheets	158.00
Galvanized sheets	172.00
USS ABRASION RESISTING	
Hot-rolled bars	117.00
Plates	115.60
Hot-rolled sheets	115.00
Hot-rolled strip	112.60

DELAWARE VALLEY high school students tour steel mill under sponsorship of Americans for the Competitive Enterprise System.

PLANT TOURS: Teach Public

Industry aids in economic education by showing facilities to students, community . . . Mutual understanding important . . . Non-profit ACES acts as "middleman" in program.

♦ PROPERLY conducted plant tours are an effective means of economic education—particularly for high school students.

A research survey of opinions of high school students before and after plant tours yielded the following:

Question: Out of every dollar received by a company from its customers, certain costs must be paid to operate the business. After a company has paid these costs, on the average how much is left from the sales dollar for profit?

Before the tours: 54 pct of the students thought that between 11¢ and 50¢ was left for profit.

After the tours: 80 pct said they believed 10¢ or less was left for profit.

Industry is becoming increasingly conscious of the need for economic education. Many companies are expanding their efforts to get their messages across to workers, owners, the community, and the public at large. Time and again high school students are singled out as one of the more important groups, especially when it is understood that the education program should be continuing and long range.

Tell Industry's Story

This is especially true in areas where industry is growing rapidly —like the Delaware Valley, where huge steel expansion has paced quick growth. As the region becomes increasingly steel conscious, producers and fabricators realize that there is a corresponding increase in the range and degree of intensity of public relations problems that may arise.

ACES Started in '49

Many industrial executives, anticipating the need for public understanding of company policies to earn and keep good will, are making use of the facilities offered by Americans for the Competitive Enterprise System.

ACES, a non-profit, non-political organization, was started in Philadelphia in 1949 as a citizens' educational movement. Since then it has established chapters in four other Pennsylvania cities and is planning further expansion in other eastern states. It has no connection with any business or labor organization.

Most of the steel industry in the Delaware Valley—including Midvale, Alan Wood, Lukens, Standard Pressed Steel, and Henry Disston & Sons—has cooperated with ACES in conducting a series of plant tours. Key community groups taking the tours include students, teachers, employees, clergymen, and women's groups.

Student programs are 3-day operations. On the first day trained volunteer speakers talk to students in their classrooms on general aspects of our economic system. An educational film, "Productivity, the Key to Plenty," is shown. Question and answer period follows.

Second day students tour the selected plant or business in small groups, talking with company personnel.

Every effort is made to present a completely objective and unbiased picture of industry in operation. Touring groups hear talks by representatives of both management and labor.

On the third day a representative of the visited company talks to students in their classroom. Subject is operation of his company and basic economic factors which determine its rate of growth.

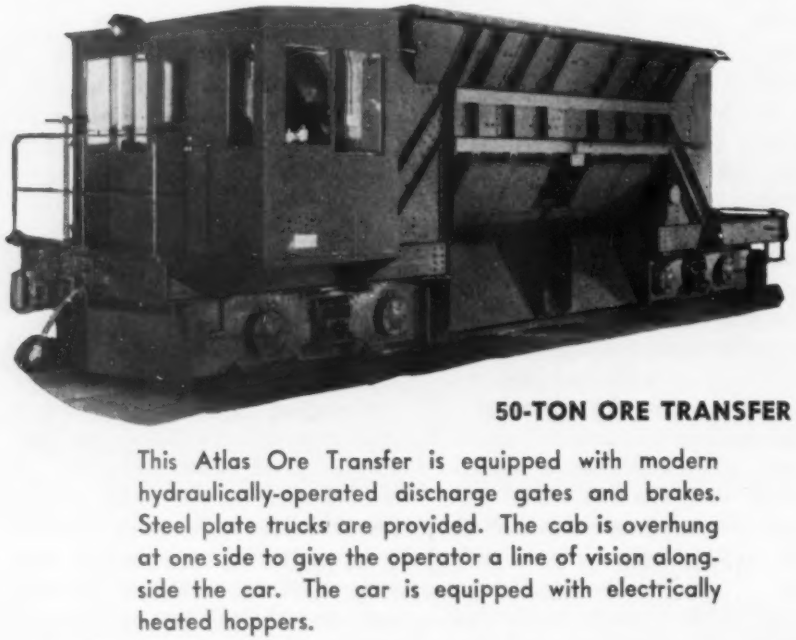
Question and answer period which follows furnishes a testimonial of the effectiveness of the program. Even the experts are sometimes surprised at the amount of change in students' views on such important economic subjects as: percentage of profit a company derives from its sales dollar; average investment an employer must make for each job offered; and the most reasonable degree of peacetime government regulation.

Strongest advantage of ACES appears to be its non-profit, nonpolitical character. Public resistance may often be expected when a public relations project is known to be the effort of a private company or business. But if the company has the opportunity to present itself to the public through the medium of an organization which is recognized as being impartial, public resistance is minimized and prospects for building understanding and good will are greatly increased.

On the HIGHLINE

It's ATLAS ORE TRANSFERS

It's Atlas Transfers for dependable, year-in, year-out service . . . for operator safety and convenience which approaches semi-automatic service.



50-TON ORE TRANSFER

This Atlas Ore Transfer is equipped with modern hydraulically-operated discharge gates and brakes. Steel plate trucks are provided. The cab is overhung at one side to give the operator a line of vision alongside the car. The car is equipped with electrically heated hoppers.

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Plating:

Claim big savings with plywood tanks for acid bath.

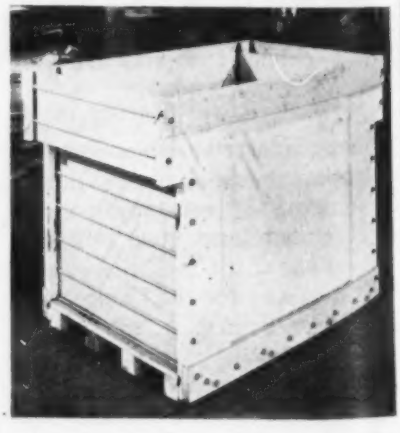
A combination of "do-it-yourself," smart design and unusual choice of material have saved between $25,000 and $30,000 for Tacoma powdered Metals Co. in a plating line built 4 years ago. Firm's powdered iron process requires 54 electroplating cells of 350-gal capacity each.

For 3 years, the company struggled along with leaky lumber tanks. Leakage problems dictated heavy framing and tie rods on all sides—but the number of seams was just too much and the tanks had to be replaced.

Cost estimates placed the price of rubber-lined steel tanks at $600 to $750 each. Too high, they said, so plywood tanks were given a try.

A resin overlaid fir plywood tank with tie rods on ends and bottom only was designed and the construction cost turned out to be only $140 each. Cheap enough—but how long do they last? Nobody cares to predict the life expectancy because the tanks have been in 24-hour-a-day service for 4 years and still show no signs of deterioration.

Hydrochloric acid with a pH of 1.0 to 3.0 is used in the Tacoma process. On top of this high acidity, tanks get rough usage and interiors are frequently gouged.



INCH-THICK fir plywood tank is held together by 1/2-in. tie rods, sealed with rubberized compound and given six coats of resin-vinyl paint.

STAMPERS: Still Scrambling

Independent metal stampers see seasonal boost . . . Some shops rehiring workers . . . Note August pickup . . . Automotive mergers slash big market—*By T. M. Rohan.*

♦ INDEPENDENT metal stamping shops are still going down a business slide. But last week a little upturn was coming into view for a few. And the rest were putting their best foot forward in all-out sales efforts.

The industry nationally in June was down 19 pct from a year ago and 14 pct from the preceding month. This was mostly seasonal. Incomplete reports for July indicate the downward trend will continue for that month.

But a spot check of shops last week indicated August business has picked up slightly, and bulk of prices have remained relatively firm. After a normally slow summer, tool shops are now beginning to rehire workers, indicating a healthy revival in 30-60 days.

Do Experimental Work

Another welcome trend was shown in the short-run stamping field. HCL Mfg. Co., of Cleveland, has had its job backlog stage a comeback from 900 at mid-May to 1050 last week, reversing a downward trend from the recent peak of 1500 in January.

This firm concentrates on runs from a half dozen to 15,000-20,000 using specialized equipment with simple, light-gage dies. Heaviest output goes into experimental work and interim production while plants are making their own long-run dies. Since development precedes new products, an increase in work for short-run stampers is an even earlier straw in the wind than regular stampers.

But regular stampers are still scrambling for business. Pressed Metal Institute, representing bulk of stampers, will devote two-thirds of its annual meeting in September to how to expand markets. Interest in this is lively. In previous years the heat has all been on production methods with only about 10-15 pct of the time devoted to sales.

A Proving Ground

Heavy discussions are scheduled on best utilizing the industry's top selling point—experience gained in tackling thousands of stamping jobs in as many different fields. This can pay off if turned into new fields and markets.

In many cases stampers act as proving ground for tool engineers. On development of parts for a mass-produced office machine, for example, 150 parts—more than half—were changed during development largely on cost-saving tool methods developed by stampers involved.

Although it would seem stampers might resent doing what amounts to free development work, they reap their harvest in repeat orders in a hotly-competitive and abnormally price-conscious field.

Hardest hit stampers have been those who concentrated on auto parts. Production cutbacks slashed their volume. And subcontracting to independent stampers was also cut back.

Brains Save Job

But stampers still have plenty of shots left in their guns and are loading a few new ones. One instance where experience pays off showed up last week. A major stamping plant concentrating on auto parts decided to branch out a little when its backlog dwindled to 2 weeks. The sales department scared up an electric motor manufacturer having trouble with stamped end housings. Although castings would cost up to 50 pct more, the manufacturer was ready to order them to eliminate customer complaints. A new method involving a 6-in. draw was developed, based on auto experience, and a substantial order resulted.

"Afraid I can't make it. I've got a mountain of work on my desk."

Auto Mergers Hurt

Merger of independent automakers is another factor affecting stampers. With integration of manufacture, one plant will turn out stamped parts for both cars where previously these parts were subcontracted by one. In Kaiser-Willys this means Kaiser will stamp parts at the Willys plant in Toledo instead of subcontracting; Packard will use Studebaker's presses and Hudson will use Nash's. Firms will thus have greater utilization of their facilities, rarely up to capacity before, and also have their own source of supply.

Hope for Subcontracts

There is a difference of opinion among stampers whether this will mean more or less business for them at the present rate of operations. With use of additional trim and other dressing up, relatively short runs on special items would probably be subcontracted. Standardization with interchangeability of parts would also boost volume, possibly beyond capacity. But all agree that there's nothing wrong that an increase in auto production wouldn't cure in a hurry.

DEFENSE

Shipbuilding:

President okays bills to boost tanker production.

Two measures destined to boost the government's tanker fleet and stimulate private tanker construction have been signed by the President. A total of 30 new vessels will be constructed under the legislation.

One of the bills permits owners of 20 tankers built during World War II to sell their vessels to the government under an engagement whereby the proceeds would be used to build 10 new vessels to be operated under the American flag.

The second authorizes the Navy to charter 15 new tankers built with private capital, to be privately owned and operated, and build an additional 5 for its own operation.

Would Aid Employment

In signing the bill, the President directed that the construction be spaced to avoid "undesirable peaks and valleys in construction and employment," indicating that this year's program will be stretched over a number of years and may be matched with another similar program next year.

President Eisenhower noted that the measures would help modernize the U. S. tanker fleet, reduce a serious mobilization tonnage shortage, create a government-owned and maintained tanker reserve, and promote employment in the shipyards which will keep vital skills intact.

Criticize European Defense Lag

Defense Secretary Wilson is urged by a Senate preparedness sub-committee to make a new examination of the Mutual Defense Assistance Program, giving special attention to wartime ammunition needs of friendly European nations.

In a report presented last week, the Senate group reveals its disappointment at the low ammunition-producing potential of U. S. allies in the MDAP setup. Western Europe, the report says, can turn out only 25 pct of the shells and cartridges required for combat.

Bulk of ammunition supplies would have to be made in and delivered by this country.

Despite the marked shortage of facilities for producing and loading explosive rounds in other MDAP countries, the report notes that the Army has not requested funds to meet the deficiency.

Three cuts have been made in army ammunition production schedules within the past year, according to the report. While output for this calendar year will average about $200 million worth per month, the rate will be down to approximately $170 million at the end of December.

Ammunition supplies for U. S. forces in the Far East and Europe apparently are sufficient to meet foreseeable needs.

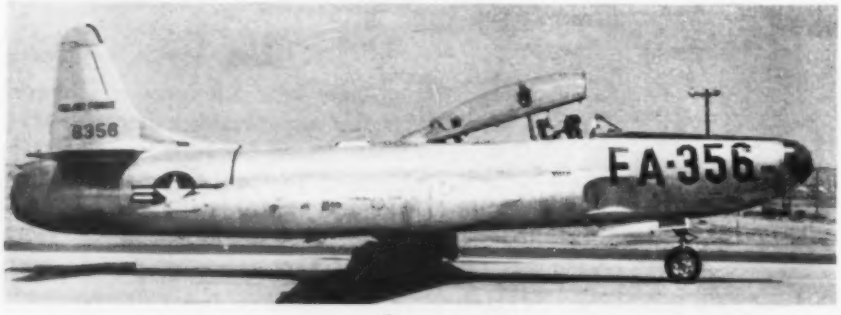
ODM Needs Less Copper

Further results of reduced military spending programs will hit producers of copper products as the Office of Defense Mobilization issues orders easing percentages of mill space reserved for copper and copper base alloy products in the fourth quarter.

Most categories of copper products are included in the reduced mill set-asides. The order comes on the heels of an announcement that defense and atomic energy requirements for steel, aluminum, and copper and brass alloys would be cut in the fourth quarter.

Exceptions in the new directive are unalloyed brass mill plate, sheet, strip and rolls, for which the percentage of space reserved is raised from 7 to 9 pct; rod, bar, shapes and wire raised from 7 to 12 pct and unalloyed seamless tube and pipe unchanged at 6 pct.

Alloyed plate, sheet, strip and rolls set aside for the final three months drops from 12 to 8 pct; alloyed rod, bar, shapes and wire from 10 to 6 pct, and alloyed seamless tube and pipe from 26 to 17 pct. Set aside space for all copper wire mill products is reduced from 13 to 8 pct, and copper foundry products and unalloyed copper powder mill products from 13 to 7 pct.



OLD HODGEPODGE heads for home. Originally built in 1947 by Lockheed as one of the first F-80As, and now modified beyond recognition, this research plane has flown as four different jet models, will spend the rest of its life on the ground as a vehicle for secret technical study at Griffis Air Force Base, Rome, N. Y. It has been in turn an F-80A, a T-33, a F-94A, a F-94B, and finally F-94C.

Contracts Reported

Including description, quantity, dollar value, contractor and address. Italics indicate small business representatives.

Trucks, fork lift, 41, $169,638, Yale Material Handling Div., The Yale & Towne Mfg. Co., Philadelphia, Pa.

Skid-mounted aircraft refueler, 20, $112,993, Gary Steel Products Corp., Lynchburg, Va.

Grinding machines hydraulic, 3, $174,780, George E. Viereck & Co., Washington.

Lathes, engine, heavy duty, (Neg 5555-Q) 5, $188,580, The R. K. LeBlond Machine Tool Co., Cincinnati.

Trucks, fork, electric, 29, $158,037, Clark Equipt. Co., Battle Creek, Mich.

Pump assys, V, $191,572, Borg-Warner Corp., Bedford, Ohio, *Ralph Freeman.*

Items 1, 5, 7, 8 and 10—Signal generator, 239 ea, $228,509, Cosmos Industries, Inc., Long Island, N. Y.

Item 1—oscilloscope tachometer, 92 ea, $497,702, General Motors Corp., Flint, Mich.

Test set, servo, 490 ea, $96,904, Telectro Industries Corp., Long Island, N. Y.

Report To Management

If you take Ike's word (and figures) for it, the "Eisenhower recession" as the cigarette admen would have it was "milder, much milder" than most people realized.

In taking inventory of the economy for the first 6 months of '54 the Administration found that as compared with first half last year: industrial production was down 8.1 pct; gross national product slipped 2.7 pct; non-agricultural employment was off 2.6 pct; total personal income was up 0.2 pct and total disposable income increased 1.4 pct.

These figures indicate that though there's no doubt we've been through a recession it was far from being as severe as the publicity it received made it seem.

Sharpest decline indicated in the Eisenhower report is the 8.1 pct drop in industrial production. But as the President pointed out, the Federal Reserve Board's industrial production index covers only manufacturing and mining, omits construction, agriculture, transportation and the many service industries. Had these branches of industry been included the loss would have been reduced considerably.

The President conceded that economic activity this year wasn't up to last year's level. But after admitting that you can't win 'em all, Ike went on to show that you can if you go back far enough.

Comparing first half '54 with same period '52, the White House economic report shows: industrial production is up 3.3 pct; gross national product mounted 4.4 pct; non-agricultural employment expanded 1.1 pct; total personal income rose 7.2 pct; total disposable income jumped 8.8 pct and per capita disposable income was up 5.3 pct.

This report on the state of the economy should do a lot to reassure the fast thinning ranks of the faint hearted. Naturally, you can't expect it to have any impact on those who find it politically expedient to play recession.

Less constructive, however, was the way the Administration felt obliged to take a bow for the fact that '53, our best year ever, and '54, a not too bad second, both came while the current Administration was in power.

Certainly Mr. Eisenhower can take very little credit for the '53 boom. Throughout most of the first half of '53 the nation was still operating on momentum from the Truman Administration, and of course the main factor affecting the economy was Korea.

No administration is fully responsible for either a boom or a bust. The party in power can do a lot to control the economy but it is certainly not the only important factor in determining which way business moves.

During the past few years Russia has probably been the major influence on our economy. Other vital elements: consumer and business spending attitudes (affected, but not entirely dependent on the party in power); inventory levels; birth and marriage rates; availability of raw materials.

The President was unfairly criticized earlier in the year when the recession seemed to be deepening, so it may be only natural that he would want to take credit for the '53 prosperity surge. Fact remains, however, that he was not responsible for either the recession or the boom and this part of his report remains an ill-concealed political maneuver.

You can expect a rash of requests from industry for tariff relief as a result of the President's action last month in hiking tariffs on Swiss watches.

The increase was put through primarily to maintain our reserve of highly skilled workers in event of defense emergency. But some have misinterpreted the watch action as a sign the Administration is veering from its liberal trade philosophy. It isn't, so most of the new requests will be nixed.

INDUSTRIAL BRIEFS

New Home . . . Taft-Peirce Mfg. Co. moved its Detroit sales office from 10700 Puritan Ave. to 10243 Puritan Ave.

Congrats . . . F. H. McGraw & Co. is celebrating its 25th birthday. Firm has completed more than 700 contracts totaling more than $1 billion. It's currently nearing completion of the biggest of all, a $1 billion atomic energy project at Paducah, Ky.

Well Done . . . The Operating Dept. of Aluminum Co. of America has received the Award of Merit from the National Safety Council.

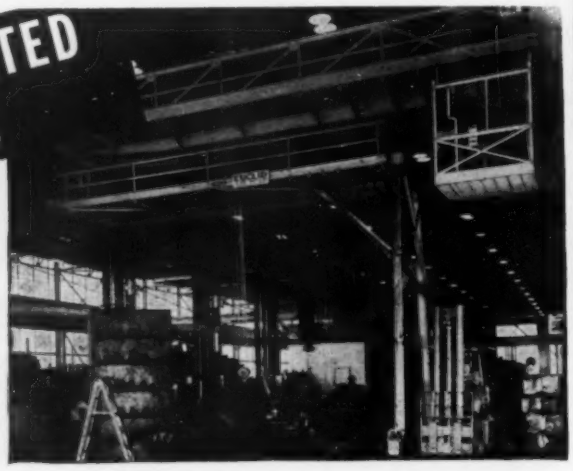
Export Rep. . . . Benchmaster Mfg. Co., Gardena, Calif., appointed Camley International Co., Inc., to handle world-wide foreign sales.

Special Issue . . . Fifty years of progress in the electrical industry will be the theme of a special issue of the *Magazine of Standards*, published by the American Standards Assn. Issues will be out Aug. 27.

Dividend . . . Monarch Machine Tool Co., Sidney, Ohio, declared a dividend of 30¢ per share, payable Sept. 1 to all shareholders of record at the close of business on Aug. 20.

Deserving . . . Edwin T. Lorig, chief development engineer, U. S. Steel Corp., will be the recipient of a John Price Wetherill Medal of Franklin Institute of the State of Pennsylvania, Wednesday, Oct. 20, at the Institute's Annual Medal Day ceremonies.

CO-ORDINATED UNITS



in...
EUCLID
Electric
CRANES

Planned cooperation between material handling units can be a vital factor in speeding production and lowering cost.

Here, for example, is a Euclid half-gantry crane designed to cooperate with the larger Euclid overhead crane and lift trucks. The installation is in the assembly bay of a large steel fabricating plant.

Parts are brought in by the lift truck. Sub-assemblies are handled by the half-gantry crane. As the assembling operations progress the larger units are moved by the overhead crane and the completed machine finally carried to the testing department.

Think of cranes as production tools and ask our engineers to give you the benefit of their long experience in speeding production with overhead handling equipment. It will entail no obligation.

The EUCLID CRANE & HOIST Co.
1361 CHARDON ROAD
EUCLID, OHIO

Expanding . . . American Can Co. started construction of a new lithographing and warehousing building adjacent to its Pacific factory in San Francisco.

Acquired . . . Byron Jackson Co. acquired Rollin Co. of Pasadena, Calif., recently.

Established . . . The Detrex Corp., Detroit, opened a New England regional office in Meriden, Conn. A. D. Chabot will be head of the new office.

Appointed . . . Clark Equipment Co. appointed Eureka Boiler Works, Eureka, Calif., to sell and service the fork-lift trucks, straddle-carriers and other materials handling equipment manufactured by the company's Industrial Truck Div.

To Start . . . Ingalls Iron Works Co., Birmingham, will fabricate the steel for the Nickel Plate Railroad Co.'s $8 million rail elevation project at Fort Wayne, Ind.. Work is scheduled to start in the next 30 days.

Appointed . . . Kaiser Aluminum & Chemical Sales, Inc., appointed American Brass & Copper Co., Oakland, as a distributor of its full line of aluminum rod, bar, sheet products and extrusions.

Grand Opening . . . Rem-Cru Titanium, Inc., officially opened a modern office building earlier this month in Midland, Pa.

Will Speak . . . The present and a former chairman of the Atomic Energy Commission will speak at the most all-inclusive conference on atomic energy ever undertaken in New England on Oct. 20 under the sponsorship of the New England Council and the Atomic Industrial Forum, Inc., of New York.

The Winner . . . Fruehauf Trailer Company's Omaha, Neb., plant won the annual nation-wide plant safety competition for the year 1953.

for transportation equipment

that stands up...

FLAT-ROLLED STEEL

produced by a specialist

The kids who roll down Oak Hill in a coaster wagon, and those of us who ride in the world's best automobiles, put a lot of faith in flat-rolled steel.

If you use flat-rolled steel in your products, rely on a specialist—Great Lakes Steel. Our entire organization is devoted to the business of making more and better flat-rolled steel for every application. Many manufacturers have found we have some unique qualifications to help them to improve products and reduce costs. We would like the opportunity to work with you on your problems.

Call on our 25 years of specialization in flat-rolled products. Our representative will be glad to discuss your particular needs at your request.

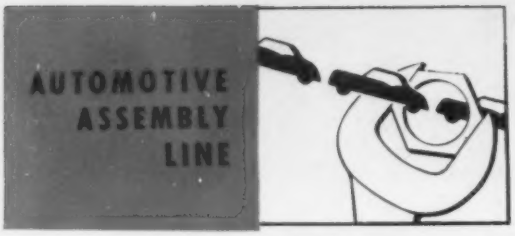
Great Lakes Steel

Ecorse, Detroit 29, Michigan

PRODUCER OF N-A-X HIGH-TENSILE STEEL NAX

UNIT OF NATIONAL STEEL CORPORATION

SALES OFFICES IN CHICAGO, CLEVELAND, GRAND RAPIDS, INDIANAPOLIS, LANSING, NEW YORK AND PHILADELPHIA



Car Buyers Boost Factory Delivery

Lure of travel, plus freight savings attract many new car buyers to automaker's delivery yards . . . Dealers still make sales, net commissions . . . See trend increasing—By *R. D. Raddant.*

◆WHETHER it's called factory delivery or customer driveaway, many new car buyers are absorbing their own auto freight costs by picking up new cars right off the assembly lines.

Taking delivery of new cars in Detroit has been a more or less dormant procedure in the postwar years of the seller's market. But this year has seen a revival of that practice with a vengeance. With auto companies bending every effort to pick up a sale, factory delivery has taken on new importance with the industry.

Ford Leads Field . . . Ford Div., and Lincoln-Mercury are probably the leaders in developing the factory delivery market. They have the advantage of the Rouge plant, Ford Rotunda and Greenfield Village as an added incentive since these Ford institutions are among the top five U. S. tourist attractions.

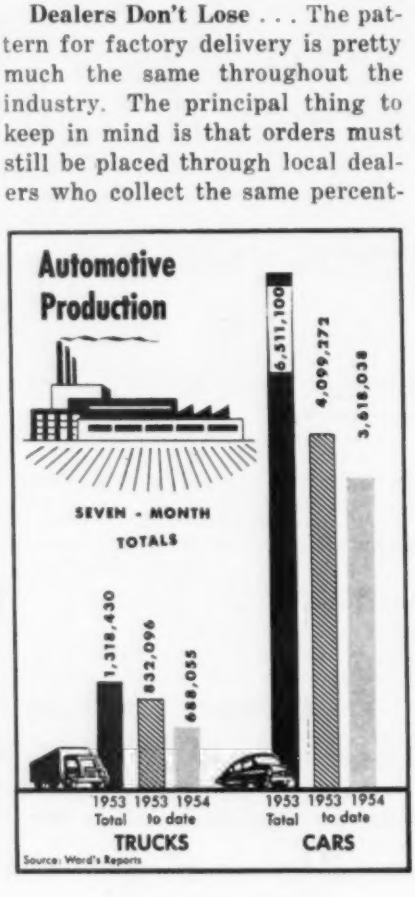
The Ford factory delivery department in downtown Detroit and the Lincoln-Mercury "Jewel Box," where the customer is treated like visiting royalty, are models in this field.

But in spite of glamorizing factory delivery, cold economics coupled with travel lure encourage an automotive buyer to pick up his car in Detroit.

Freight Costs Vary . . . Whether a car is assembled in the Deep South, the Far West or the East, buyer must pay the freight from main plant to point of delivery. This can go over $300 to the West Coast, nearly $100 to the East Coast, and intermediate figures depending on distance from Detroit and weight of the car. Obviously, this covers the train fare from those spots to Detroit and can even pay for all or part of the family.

Ford's new facilities are handling 1400 cars a month. In the first 7 months of 1954, Oldsmobile customer driveaway facilities have handled 9202 cars in Lansing. Lincoln-Mercury is delivering 75 pct more cars from Detroit than a year ago. Cadillac's factory delivery is 20 pct higher.

Dealers Don't Lose . . . The pattern for factory delivery is pretty much the same throughout the industry. The principal thing to keep in mind is that orders must still be placed through local dealers who collect the same percentage they would if delivery was made at the dealership.



Customer places his order, in advance with his local dealer, (Ford, for example, asks two weeks lead time before delivery), then makes plans to be at the factory on the specified date of delivery.

By intricate scheduling, the car is at the driveaway department when the customer arrives, fully road tested and conditioned for the long drive to the new owners home town.

Make Delivery Dramatic . . . Driveaway departments shrewdly realize that receiving a new car is a big event for most people. They make a production of it in most cases. Some companies provide luxurious lounges with all kinds of travel services for the return trip.

Most of the factory deliveries originate in West Coast points, but all companies except Oldsmobile accept orders for factory delivery from anywhere in the U. S. Ford had some restrictions until Aug. 1 but now offers the service anywhere. Oldsmobile, however, is also enlarging its customer driveaway department to meet the demand.

Auto company officials don't like to talk about whether dealers around the country offer free Detroit trips to purchasers. But in some cases where competition makes it necessary, it can be a legitimate sales gimmick.

John F. McGuire, Ford factory delivery manager, believes that the trend will level-off at a bit

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
Aug. 14, 1954...	102,020*	16,584*
Aug. 7, 1954...	108,358	15,510
Aug. 15, 1953...	131,098	25,428
Aug. 8, 1953...	114,671	23,000

*Estimated. Source: *Ward's Reports*

more than the present rate. Ford factory delivers about 1400 cars a month, but has new facilities that can handle a capacity of 2000 cars in 30 days. That is a lot of absorbed freight.

Brakes:

Cost blocks switch to disk types.

A recent discussion in this column of the disk brake manufactured by Auto Specialties Mfg. Co. (THE IRON AGE, July 22, 1954, p. 85), might have left the impression that disk brakes are a new and untried concept. This doesn't happen to be the case.

Chrysler Corp. has had disk brakes on one or more of its lines since 1949 and they are standard equipment today on the Crown Imperial, Chrysler's largest and most expensive car.

Furthermore, Ausco brakes are original equipment on 12 tractors and the company has just received orders for brakes to be used on jet aircraft. Obviously, the self-energizing disk brakes aren't completely new and surprising.

The fact remains that the disk brake is one direction that automotive engineering studies are taking in solving the brake problem that confronts the industry. However, the problem is not one of providing enough friction surface to stop any car at a reasonable distance, but one of heat accumulating from frequent braking.

Heat Biggest Problem

"There is no problem of providing the necessary friction characteristics," points out A. G. Loofbourrow, Chrysler's chief chassis engineer. "Heat is the limiting factor. We can provide the lining for drum brakes if we can keep the heat down."

Heat dissipation is the biggest advantage of the disk brake. Its larger mass keeps heat down initially and finned housings provide currents of air for rapid heat dissipation.

Disk brakes are self-energizing to the extent that Chrysler does not provide a power booster for the disk equipped Crown Imperial, even though it is the heaviest of its lines. A self-adjusting feature is also incorporated in the design.

The barrier to wider use appears to be merely a matter of cost—prohibitive at the present time. For example, disk brake installation cost Chrysler a $125 penalty" for each car. This has been lowered and Auto Specialties has made progress in cutting cost, but still not to an encouraging level.

Drum Brakes Prevail

Conclusion is that the drum brake still offers room for improvement, and most auto engineers believe it will prevail for some time to come.

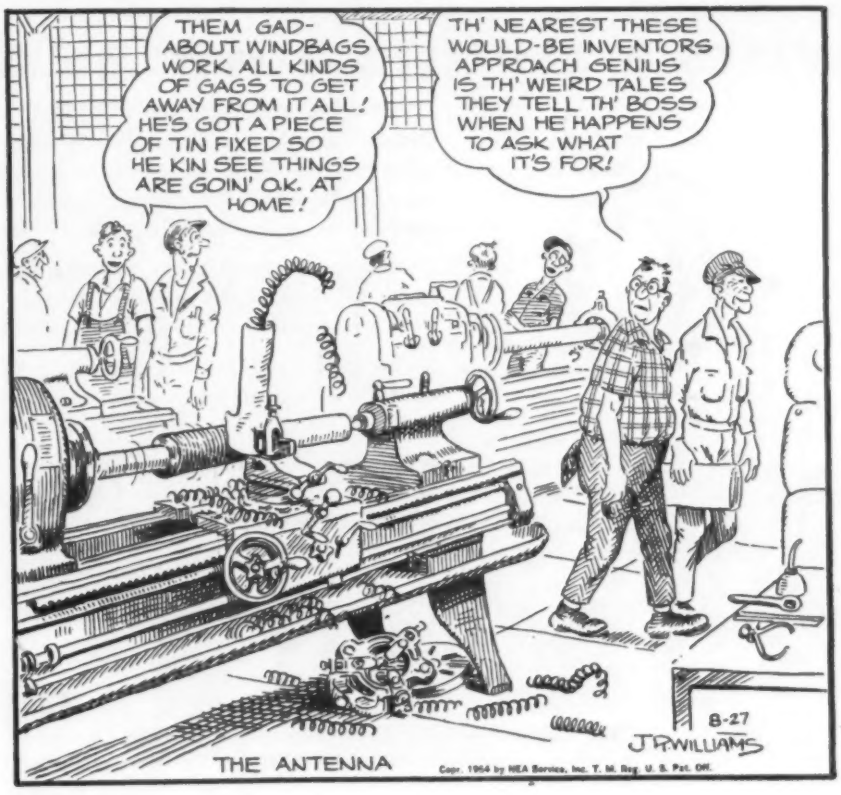
Big problem is that the area for improvement is small. Brake drums are just about as big as they can get under present wheel construction trends. The 12-in. brake used on the larger cars is about the maximum. Air cooling has its limitations, too, because most of the heat problem occurs at comparatively slow speeds instead of at high speeds where air blast is helpful. Drums have also been widened to almost the maximum for present wheel construction.

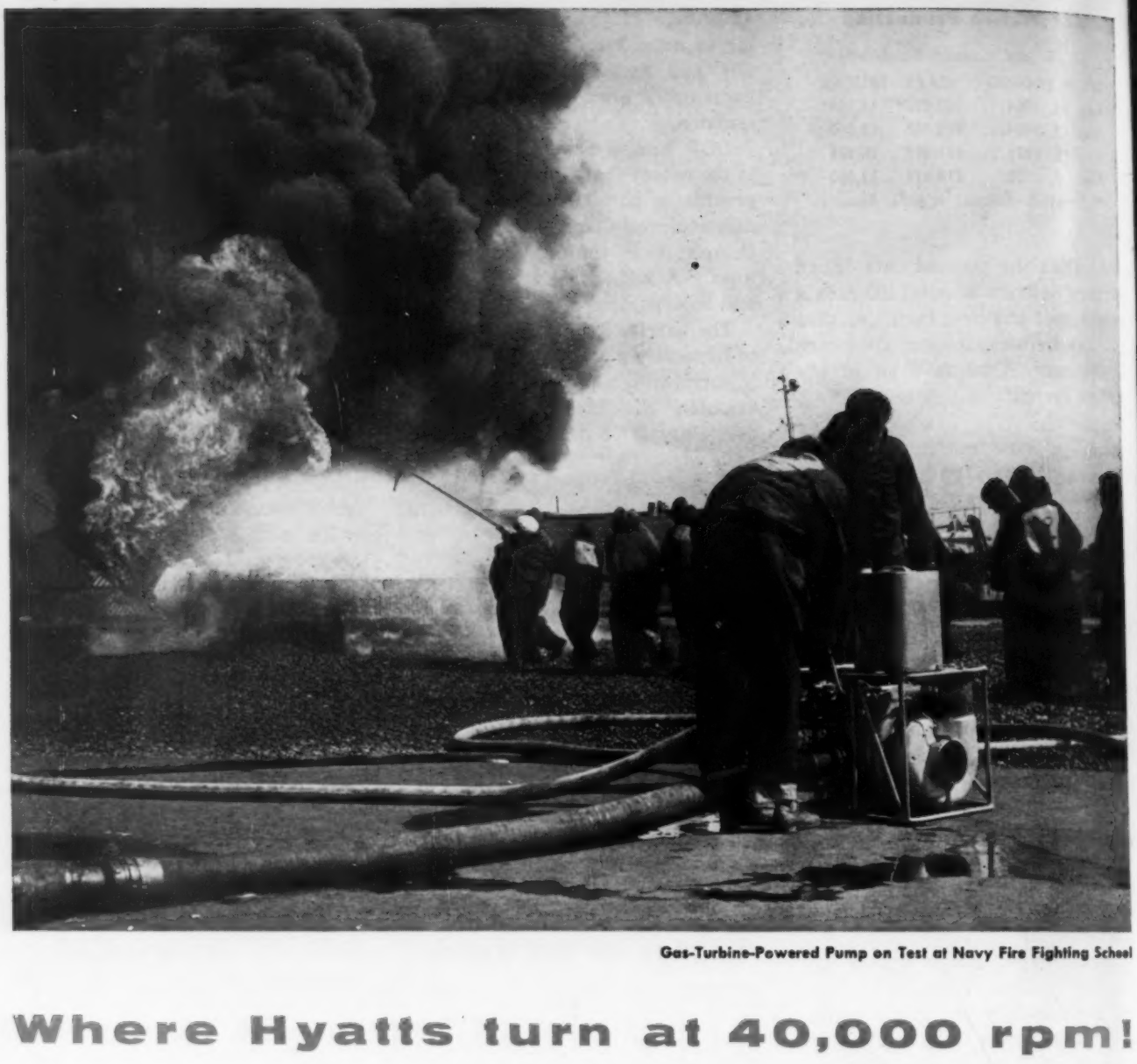
Market Tubeless Tires

Look for tubeless tires as optional or original equipment on most 1955 cars. The trend, started by Packard, is picking up steam to the point where the old tire and tube combination may be obsolete before too long.

Goodyear Tire and Rubber Co. is the first to introduce tubeless tires at the same price as the old tire and tube. Although diehards may insist that they prefer the old style, once an automotive trend gets well under way, it usually goes all the way.

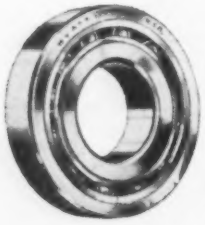
THE BULL OF THE WOODS — By J. R. Williams


THEM GAD-ABOUT WINDBAGS WORK ALL KINDS OF GAGS TO GET AWAY FROM IT ALL! HE'S GOT A PIECE OF TIN FIXED SO HE KIN SEE THINGS ARE GOIN' O.K. AT HOME!
TH' NEAREST THESE WOULD-BE INVENTORS APPROACH GENIUS IS TH' WEIRD TALES THEY TELL TH' BOSS WHEN HE HAPPENS TO ASK WHAT IT'S FOR!
8-27
J.R.WILLIAMS
THE ANTENNA
Copr. 1954 by NEA Service, Inc. T. M. Reg. U. S. Pat. Off.



Gas-Turbine-Powered Pump on Test at Navy Fire Fighting School

Where Hyatts turn at 40,000 rpm!



Old in theory, gas turbines are comparatively new as a practical power source. So it was big news in engine development when Solar Aircraft Company, of California, announced the world's first portable, hand-started gas turbine power plant.

Developing 50 horsepower, the new lightweight operates at the high speed of 40,000 rpm—or twenty times the speed of most automobile engines! And that's where *we* come in.

To be sure of complete bearing dependability for such high-speed operation, Solar turned to Hyatt . . . and there's a Hyatt Hy-Load Roller Bearing at the most critical position on the turbine shaft.

Whether you're building locomotives or lawn mowers, and whether shafts turn at 4 or 40,000 rpm, you'll get better bearing performance from *Hyatts!*

HYATT

ROLLER BEARINGS

STRAIGHT ◯ BARREL ◯ TAPER ◯

HYATT BEARINGS DIVISION • GENERAL MOTORS CORPORATION • HARRISON, NEW JERSEY

THIS WEEK IN WASHINGTON

Ease Up on Red Trade Restrictions

Government preparing to lift ban on export of industrial goods to Communist countries . . . Red China not included . . . Nonstrategic machinery, farm tractors, selected chemicals may be shipped—By G. H. Baker.

♦ THE GOVERNMENT is getting ready to lift its ban on export of industrial goods to Iron Curtain areas, not including China. Among the classifications of goods soon to become eligible for shipment to Communist countries: nonstrategic machinery, farm-type tractors, and selected chemicals.

As far as the broad category of "machinery" is concerned, the relaxation of controls means that the U. S. Commerce Dept. will approve licenses for shipment of almost all types of machinery intended for production of civilian-type goods.

Nothing that can possibly be readily converted to military usage will be approved for export, trade officials point out.

List 150 Items . . . In all, about 150 items are being included on the list of products and commodities now eligible for export licenses.

Trade with China still is banned, however. Relaxation of the rules does not apply for that country.

Hit Yearend Buying . . . Heavy buying at the end of the fiscal year by the Armed Forces, seeking to use their unexpended funds, has been condemned by a Senate group as a poor procurement policy.

Hasty commitment of available money in the final weeks before June 30 each year often leads to the acquiring of unneeded items, The Senate Small Business Committee cautions in a new report.

Warning that year-end haste to obligate remaining credits is a form of irresponsibility, the committee calls on the military to stop the practice. The lawmakers suggest that legislative action might be considered as a possible means of insuring logical spending of appropriated funds.

Contained in the same report is criticism of the Armed Services for delays in contract administration and abuse of the authority to negotiate buying agreements. Delays in administration, the committee says, are a big problem for the small supplier.

Case Of Foot Dragging . . . Cited as an example of this footdragging is a case in which a procurement of tractors and scrapers for the Army Engineers was ruled "illegal" after about 90 pct of the units called for had been delivered.

Despite deficiencies of this type, the committee finds encouraging evidence of progress in the program to place a better share of military business with small companies. It is noted that in the area considered suitable for contract placements with small firms, the Navy in the first 6 months of fiscal 1954 awarded 85.2 pct of prime contracts to such firms; the Air Force placed 78 pct; and the Army placed 69 pct.

BREAKING GROUND for Ontario hydroelectric project last week are (l to r) Louis St. Laurent, Canadian Prime Minister, New York Gov. Thomas E. Dewey, and Ontario Prime Minister Leslie Frost.

Aid For Anthracite . . . Is the use of anthracite feasible in firing blast furnaces? Cost-wise, is anthracite competitive as a blast furnace fuel?

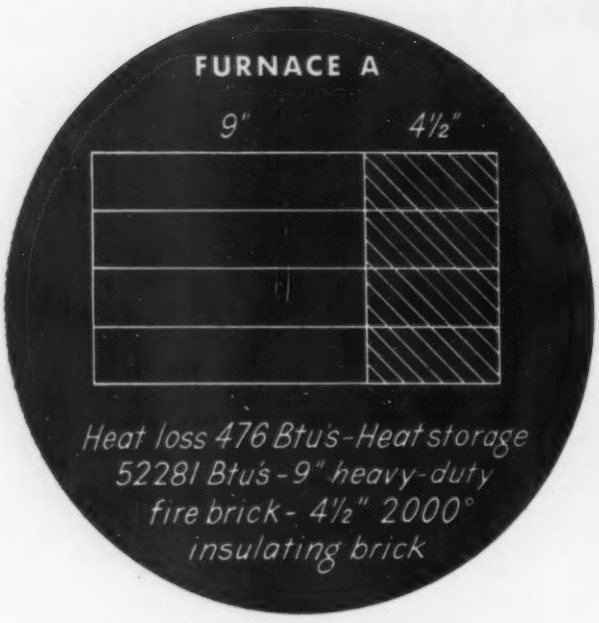
Government engineers are asking some of industry's furnace experts for answers to these questions. It's part of the energetic drive sparked by President Eisenhower to stir up some new business for the faltering anthracite industry.

Felix Wormser, Assistant Secretary of the Interior, has held several meetings on the subject with steel and coal engineers which he says were "highly constructive." But he makes no commitments as to what contracts—if any—he is prepared to enter into at this stage of the exploration.

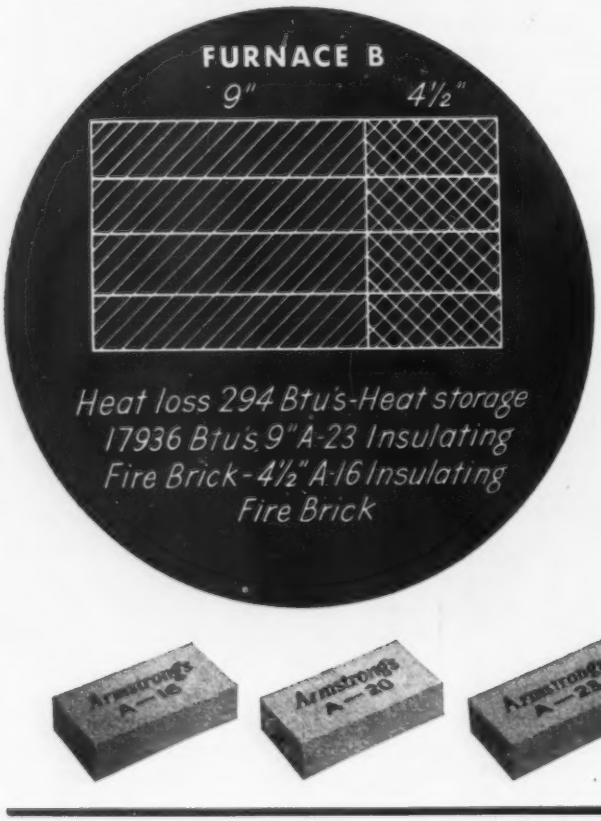
U. S. Bureau of Mines is prepared to run a series of tests on the use of anthracite as blast furnace fuel. It's now up to Mr. Wormser and other government officials to decide if this is warranted.

Ship Coal Overseas . . . And Ike, interested in the same problem is weighing a proposal backed by Senator Duff, R., Pa., for export of Pennsylvania anthracite under the foreign aid program. Idea is to

Which wall construction promotes faster heating cycles?



NORMALIZING FURNACE:
for treating high-speed steel tools: intermittent operation; maximum temperature is 2200° F.



The speed of a furnace's operating cycle is greatly influenced by the thermal efficiency of the furnace construction. The less heat loss and heat storage, the shorter the time required for heating and cooling the furnace.

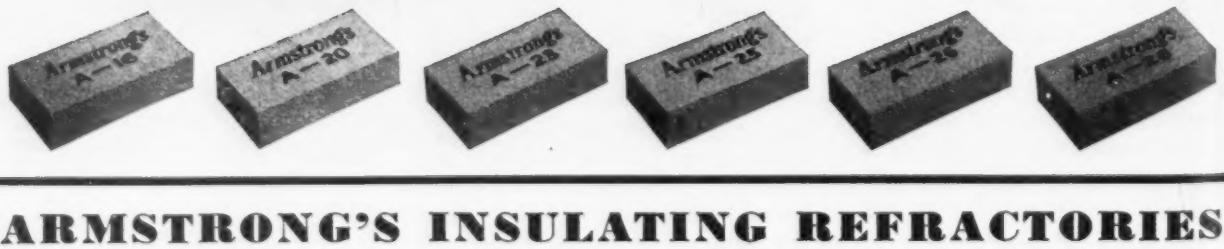
For example, in the diagrams shown, furnace "A" has a lining of 9" of heavy-duty fire brick and a backing of 4½" of 2000° insulating brick. Heat loss is 476 Btu's per square foot per hour, and heat storage is 52,281 Btu's. There is a cold face temperature of 260°.

Note the improved performance of furnace "B's" construction. 9" of Armstrong's A-23 Insulating Fire Brick form the lining, while 4½" of A-16 brick are used as back-up. Heat loss is cut to 294 Btu's, an almost 40% reduction. Heat storage drops to only 17,936 Btu's . . . a reduction of more than 65%! This results in a cold face temperature of less than 200°.

In addition to producing faster heating and cooling cycles, this more modern construction also effects great savings in fuel. And the A-23 brick are rugged enough to withstand the constant heating and cooling, so spalling is no problem.

Do you have a furnace problem?

You'll find it's a good idea to consult your Armstrong engineer whenever you have a furnace relining or rebuilding job. His knowledge of insulating brick and furnace construction can be a great help in getting top operating efficiency from your furnace. Just call your nearest Armstrong office or write Armstrong Cork Company, 2708 Susquehanna Street, Lancaster, Pa.



ARMSTRONG'S INSULATING REFRACTORIES

help ease the unemployment problem of the anthracite coal mining industry.

Large quantities of anthracite were exported in the early days of the Marshall Plan program (1948-1949) but were shut off when the coal mines in Western Germany, France, and England returned to normal production. President Eisenhower is "completely sympathetic" to the plight of hard coal areas, Mr. Duff reports.

Pricing:

New ruling on when price discrimination is illegal.

Clayton Anti-Trust Act does not require that price discrimination be between customers who compete in order to be illegal, a Federal Trade Commission hearing examiner has ruled.

But competition must be established to show injury to competition in the case of a secondary line. The findings came as Examiner John Lewis denied a motion to dismiss charges against Sunshine Biscuits, Inc., Long Island City.

Mr. Lewis denied the firm's contention that the complaint, because it did not charge injury to competing customers, was insufficient. The examiner also ruled that purpose of a complaint is to inform the accused company of the charges against it, and not a detailed legal argument. He permitted the original complaint to be amended, however, to allege injury to competing retailers.

Basis of the complaint was a "discount" plan the bakery maintained with its different retail store customers. The plan has been discontinued, but another substituted which, the examiner says, "might be just as objectionable." Mr. Lewis also accused the firm of dropping the original plan to meet the actions of a competitor, and not to comply with the Clayton Act.

KO Alien Property Bill

President Eisenhower has killed legislation permitting the return of German and Japanese assets seized by this Government during the war because pending bills fail to make any provision for settling American war claims.

Mr. Eisenhower, in a letter to German Chancellor Konrad Adenauer, points out that the German economy was not hampered by a large reparation burden. Original legislation to retain the seized assets provided that they be used to compensate American war claims, eliminating the need of an appropriation by Germany of $100 to $250 million.

Census May Run Amuck

Funds to take the important censuses of manufacturing, business and mining hit rough sledding in a House-Senate conference committee straightening out differences in the $2 billion supplemental appropriation bill.

The conferees, while reportedly agreeing to a Senate appropriation of $8.4 million for the nose-counting project, hit bitter disagreements on other provisions of the two versions of the bill. As a result, Commerce Dept. and business leaders worried that the census appropriation might become a compromise issue and be knocked out at the last minute.

A bill has already been enacted authorizing the census of manufacturing (costing $3.4 million); business, including retail and service trades, and mining and mineral industries. The census would begin next year to survey the results of 1954 business, and take about 2½ years to complete, if the funds are appropriated. Another $5 million would be needed later to finish the project.

Stockpile Fluorspar

Metallurgical grade fluorspar will be added to the nation's stockpile of strategic and critical materials under a new directive by the Office of Defense Mobilization.

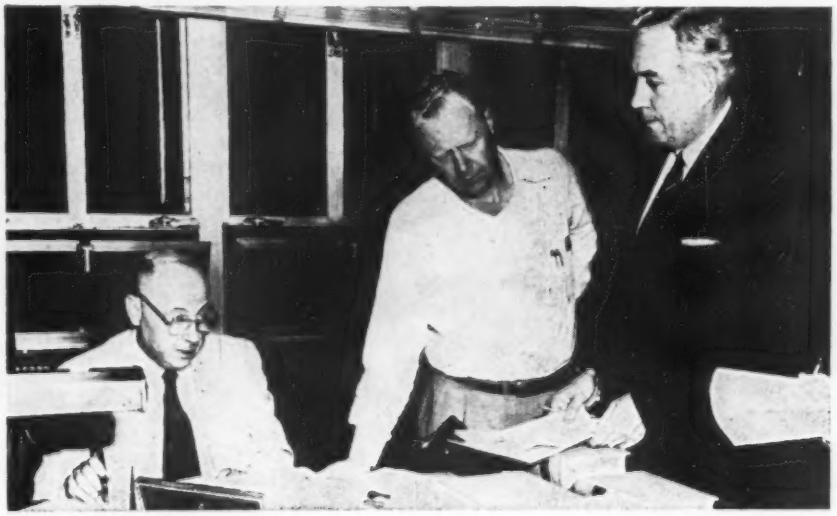
ODM has directed the General Services Administration to purchase concentrates from domestic ores only. The material, used principally as a flux in steel production, is placed on the stockpile list, ODM says, because requirements would exceed domestic production during an emergency.

GSA declined to announce the amount that will be purchased for security reasons.

Booz With BDSA

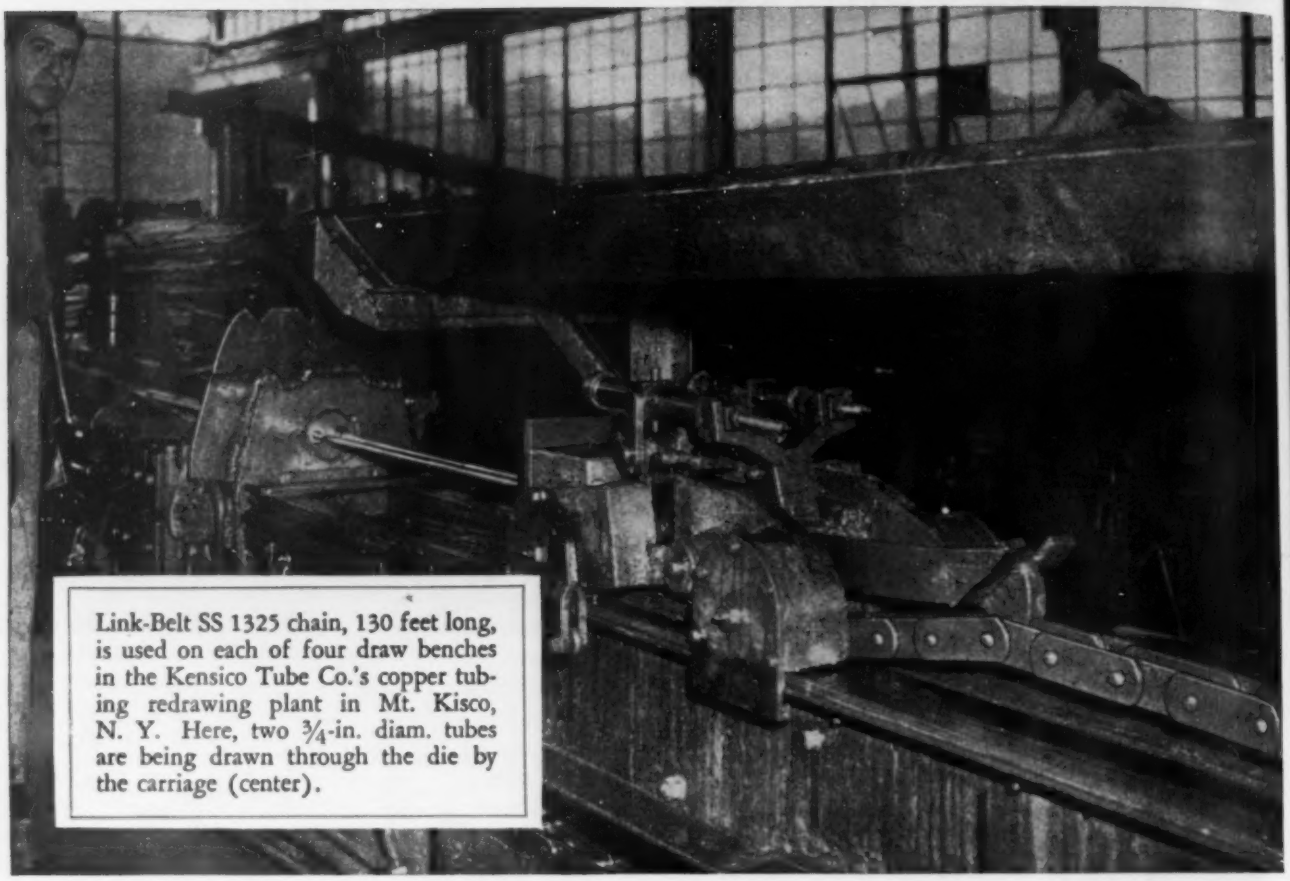
Norton A. Booz, chairman of the board of Federal Machinery Sales Co., Chicago, has been named assistant director of the Metalworking Equipment Division of the U. S. Commerce Department's Business and Defense Services Administration.

Mr. Booz, who will serve as an unpaid consultant, held a similar post with the now defunct National Production Authority from Nov., 1952, until June, 1953.



TEMPORARY restraining order is signed by Federal Judge R. L. Love to hold Oak Ridge and Paducah 4500 atomic workers despite strike vote.

Here's why so many of the nation's draw benches use LINK-BELT chain



Link-Belt SS 1325 chain, 130 feet long, is used on each of four draw benches in the Kensico Tube Co.'s copper tubing redrawing plant in Mt. Kisco, N. Y. Here, two ¾-in. diam. tubes are being drawn through the die by the carriage (center).

No ONE chain serves every purpose —get the RIGHT one from the complete line

Class H drag chain—for drag conveyors, handling shavings or other refuse in runways or troughs.

Class C combination chain—popular, durable, low cost design for elevators, conveyors.

LXS chain — particularly suitable for heavy-duty drive and conveying jobs.

Transfer chain with tilting dogs — for plate and slab travel, loads up to 300,000 pounds.

LINK-BELT offers the chain that's best for every job

WHETHER it's for a 5000 or a 100,000-pound bench, Link-Belt draw bench chain is built to maintain close pitch and correct sprocket contact. Links are accurately machined after hardening by a special process that assures longer chain life.

Manufacturing refinements such as these are typical of every chain in the complete Link-Belt line. Accurate control of raw materials and manufacturing processes is your assurance of uniformity.

For complete information on chains and sprockets for draw bench or any drive or conveyor service, see your Link-Belt sales representative. He can show you the *one* chain that's best for your requirements.

LINK-BELT

CHAINS and SPROCKETS

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Sydney; South Africa, Springs. Representatives Throughout the World.

PERSONNEL

The Iron Age SALUTES

Marvin R. Anderson

A calm, unruffled manner masks a quick-thinking, fast-moving executive talent that has helped keep his company a leader in gear production equipment manufacturing.

Marvin Anderson, Michigan Tool Co.'s executive vice-president, is a deceptive man. An unruffled manner and deliberate-seeming movements hide a quick-thinking, fast-moving personality. His ability to get to the heart of a problem, then move quickly into a well-thought-out course of action has played a big role in maintaining his company's top-rated role in gear production equipment and machine tools.

It's pretty typical of Marvin that he trained himself carefully for his job. Son of one of Michigan Tool's founders, he planned his role in the company's future by combining a lot of extra metallurgy credits with a mechanical engineering degree from Michigan State. He joined the company in 1935, worked throughout the plant for thorough understanding of all phases of manufacturing operations.

Today he uses his hobby of flying to keep him in intimate touch with all his company's branch plants. While his problems now are largely managerial, he finds his shop and technical background invaluable. Marvin says he finds this particularly true when it comes to developing and producing new types of equipment.

He points with pride to gearmaking innovations developed under his guidance like the Shear-Speed gear shapers, automatic inspection tied in with machine control, ultra-speed hobbers and Michigan Tool's new spline rolling process.

His activities and interests have won attention outside the company too. As a speaker, he is in demand by technical societies. This spring he was elected vice-president of American Gear Manufacturers Assn. This latest post added to an already hefty work load may make it a little tougher for Marvin to spend all the time he would like with his wife and two children, but it's a safe bet he'll find time for that too. And he won't look like he's hurrying.

CONTACT MAN FOR AN ORGANIZATION SERVING YOU

In Los Angeles his name may be Joe, in Cleveland it may be Harvey. Like his "brothers" in principal cities throughout the country, he is *your* key to more helpful information and *complete assistance* in the use of tool, alloy, or stainless steel. He's the fellow on the telephone order desk at your nearest Carpenter MILL-BRANCH WAREHOUSE.

The first time you call him, you'll discover you're getting something *more* than "just steel service". For he is backed by a MILL-BRANCH WAREHOUSE organization. It embraces "trouble-shooting service" right in your own plant. It is backed by trained delivery crews and modern equipment to process orders, fast.

Most important—it is *part and parcel* of the specialty Mill in Reading. Every time you call your Carpenter MILL-BRANCH WAREHOUSE you benefit from Mill Laboratory and Metallurgical Help, Mill Quality Controls—*comprehensive Mill Service.*

Truly, it's almost like having a *specialty* steel Mill right next to your receiving dock!

Whenever you want specific job recommendations or help with a problem, get it by calling Carpenter. Try it and see. Simply pick up your phone and talk to the man on the order desk at your nearest Carpenter MILL-BRANCH WAREHOUSE or Distributor. He'll put you in touch with the person who can help you. The Carpenter Steel Co., 121 W. Bern St., Reading, Pa.

Carpenter STEEL — Mill-Branch Warehouse Service

SPECIALTY TOOL • ALLOY and STAINLESS STEELS

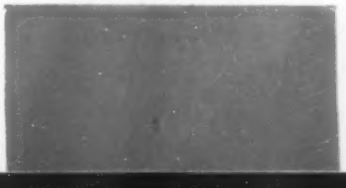
The Iron Age INTRODUCES

JOHN LAWRENCE, elected executive vice-president, Joy Mfg. Co., Pittsburgh.

DONALD A. COMES, elected vice-president, Farrel-Birmingham Co., Inc., Ansonia, Conn.

ALBERT P. SCHWEIZER, elected vice-president — Automotive Engineering, Motor Wheel Corp.

F. B. DOANE, elected chairman of the board, Magnaflux Corp.



James W. Dickey, named president, **Ohio Hoist & Mfg. Co.,** Cleveland and of Alcaloy Inc., Trenton, N. J.

Walter E. Gregg, appointed vice-president and assistant general manager, **Rem-Cruc Titanium, Inc.,** Midland, Pa.; **Dr. Walter L. Finlay,** appointed vice-president and manager of research; and **John M. Dempsey,** becomes assistant secretary.

Alfred E. Kadell, elected senior vice-president, **Great Lakes Steel Corp.,** subsidiary of National Steel Corp.

Richard T. Coyne, becomes assistant to the president, National Motor Bearing Co., Inc., Redwood City, Calif.

I. Wendell Hamm, appointed director of manufacturing, **The Corborundum Co.,** Niagara Falls, N. Y.

William S. Blakeslee, appointed director of government relations—Defense Operations, **Chrysler Corp.,** Detroit.

Howell W. Murray, elected to board of directors, Gisholt Machine Co., Madison, Wis.

Raymond F. Jalbert, K. Thomas Bryant and **Roy R. Winn,** are sales engineers, new Detroit sales office, **The Taft-Peirce Mfg. Co.**

Edwin C. Walter, appointed to work on special assignments, Wolverine Tube Div. of **Calumet & Hecla, Inc.,** Detroit.

R. H. Isbrandt, appointed chief design engineer, American Motors Corp., Nash Div.

Richard S. Smith Jr., appointed public relations director, Central Foundry Div., General Motors Corp., New York.

Earl C. Sleeman, bromoted to chief engineer, **Lith-I-Bar Co.,** Holland, Mich.; and **Edward Ligler,** promoted to engineering staff.

M. N. Halberg, named application engineer, Large Motor and Generator Dept., **General Electric Co.,** Schenectady; and **J. Frederick Ranson,** elected manager-product planning and market research, Small Turbine and Supercharger Dept.

Howard J. Evans, promoted to chief engineer and manager, Central Gas Products Research & Development Dept., **Rockwell Mfg. Co.,** Pittsburgh; and **H. A. Altorfer,** named chief engineer and manager, Central Valve Research & Development Dept.

P. L. Dafoe, becomes head of new Dexion Div., **Acme Steel Co.,** Chicago; and **Lewis R. Miller,** appointed assistant manager, Dexion Div.

Leo J. Dornbos, appointed manager, new Cleveland office, **Sprague Electric Co.,** North Adams, Mass.

Banks W. Clark, appointed manager, Oklahoma City sales office, **The Trane Co.,** La Crosse, Wis.

Carl A. Claus, appointed manager of Eastern Sales, **R. A. Jones & Co., Inc.**

J. F. Donohue, appointed assistant district manager, **Kaiser Aluminum & Chemical Sales, Inc.,** Oakland.

Raymond P. Devoluy, appointed manager, new National Marine Dept., **The Glidden Co.,** Cleveland.

John P. Debri, promoted to a position in charge of special duties in the office of the district manager of operations, Chicago, **U. S. Steel Corp.;** and **Joseph J. Just,** becomes general superintendent, Joliet Works, American Steel & Wire Div.

David H. Fisher, appointed plant manager, Oliver Div., **Oliver Iron & Steel Corp.,** Pittsburgh.

Charles J. Parker, named electrical engineer, **The Studebaker Corp.,** South Bend, Ind.

James C. Keney, appointed to sales staff of Chicago district office, **E. W. Bliss Co.,** Canton, Ohio.

Samuel O. Perry, Jr., named chief of missile design, **Chance Vought Aircraft, Inc.,** Dallas.

Marlin R. Hemphill, appointed general manager in charge of Carmet Div., Ferndale, Mich., **Allegheny Ludlum Steel Corp.,** Pittsburgh.

Lawrence L. Hall, becomes superintendent of hot strip mills, **Republic Steel Corp.,** Warren, Ohio; and **Harold E. Freeland,** abpointed assistant superintendent of the Warren hot strip mill.

L. Jack Clarke, appointed general sales manager, Leschen Wire Rope Div., **H. K. Porter Co., Inc.,** St. Louis office.

John W. Gibb, appointed sales manager, Chicago area, **C. A. Roberts Co.;** and **Clarence T. Johnson,** becomes sales manager, Chicago

E. R. Sliger, appointed assistant general sales manager, Westinghouse Electronic Tube Div., **Westinghouse Electric Corp.,** Elmira, New York.

DR. HOWARD R. SPENDELOW, Jr., named assistant director-Research, Metal Research Laboratories, Electro Metallurgical Co.

RONALD V. BENNETT, appointed general sales manager, Fabricating Div., The Plume & Atwood Mfg. Co.

HERBERT A. SILVEN, named head, Engineering Dept., Norton Co.

DR. FRANCIS J. SHORTSLEEVE, named manager, Metals Research Group, Electro Metallurgical Co.

For every type of shearing machine and every kind of job
"multicut"
SHEAR BLADES and ROTARY KNIVES
Rx Engineered to the job . . . Every Wapakoneta blade is made to exact specifications, designed for the particular job. Complete records with order number of each blade makes possible duplication of exact size and temper at any time.
"MULTICUT", "TUFCUT", "HOT WORK"
THE WAPAKONETA MACHINE CO.
WAPAKONETA, OHIO.
Knives Engineered for the Job Since 1891

How fast CAN YOU PRE-HEAT AN 8" DIA. BRASS OR COPPER BILLET TO 1600°F.?

20 MINUTES HALF-HOUR ONE HOUR FOUR HOURS

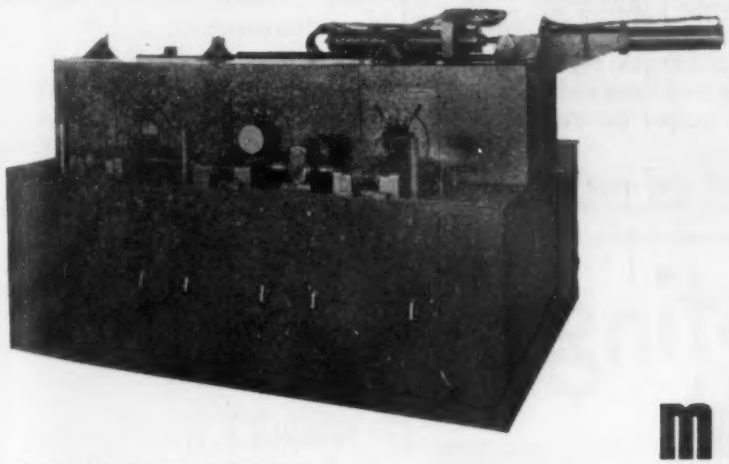
COMPARE WITH WHAT IS BEING DONE WITH A MAGNETHERMIC LOW-FREQUENCY (60-CYCLE) INDUCTION HEATER

● The Magnethermic pre-heats an 8" dia. copper or brass billet every minute. Unusual? No. This speed explains why the copper and brass industry is taking a serious look at low-frequency (60-cycle) induction heating.

In addition to speed, the heater offers other operating advantages. Individual temperature control of each billet assures uniform heating of each billet. No chance of cold or overheated ones.

A Magnethermic does not require warm-up time, eliminating scheduling billets far in advance. Space (8' x 10' average), is many, many square feet less than conventional heating equipment. Maintenance — nothing to maintain but the heating coils and those require infrequent attention.

Magnethermic pioneered low-frequency (60-cycle) induction heating. You can obtain complete information by writing, phoning or wiring your inquiry or request to Magnethermic. Prompt reply.



3-coil Magnethermic brass billet heater rated at 8,000 pounds per hour.

60-CYCLE

MAGNETHERMIC®

corporation

3990 SIMON RD. YOUNGSTOWN 7, OHIO

INDUCTION HEATING

en Talgo...

el tren de mañana

CIRCLE L

LEBANON Castings are at work

SPANIARDS marvel at these Talgos that flash by on the Madrid to San Sebastian run. Developed by Spanish and United States designers, built by American Car & Foundry Company, the Talgos are more than streamliners. They are an entirely new concept in railroading! The economical, light-weight Talgos hug the rails, safely rounding curves at 80 to 90 MPH, reaching 130 MPH on the straight-a-ways. And *all* the alloy castings in these remarkable trains are Lebanon CIRCLE Ⓛ . . . 22 for each train*.

In programs requiring creative effort you'll find Lebanon engineers and metallurgists working directly with the designers to produce castings with outstanding characteristics. Such a program created *the Talgo . . . el tren de mañana!*

See—STEEL WITH A THOUSAND QUALITIES—37 min., full color sound film on the making of steel castings. For information write: Dept. A. Lebanon Steel Foundry.

*Made of CIRCLE Ⓛ 205, a light-weight, strong and tough alloy. Typical castings are illustrated above.

LEBANON Castings

CARBON, SPECIAL ALLOY AND STAINLESS STEEL

CIRCLE L

LEBANON STEEL FOUNDRY LEBANON, PA.

Gunnar B. Mohline, appointed general supervisor of Specifications and Costs, Spaulding Works, **Crucible Steel Co. of America.**

John J. Maloney, named superintendent, **Kaiser Steel Corp.**'s Salvage Dept., Fontana, Calif.

Meritt F. Myers, becomes plant manager, **Ferrod Mfg. Co.,** subsidiary of the Ferro Corp., Batavia, Ill.

James A. McGowan, becomes assistant district sales manager, New York district, **Aluminum Co. of America;** and **William F. Courter,** becomes assistant product manager for sand and permanent mold castings, Vernon Works, Los Angeles.

George E. Kemper, appointed general manager, Welding Products Div., **A. O. Smith Corp.,** Milwaukee.

John H. Pettit, appointed sales agent in eastern Canada, Alloy Tube Div., **The Carpenter Steel Co.,** Union, N. J.

Paul W. Moehle, appointed West Central region manager, **Detrex Corp. of Detroit.**

J. R. Stumph, appointed conduit representative, in Northwest, Spang-Chalfant Div., **The National Supply Co.,** Pittsburgh.

Nate A. Wade, appointed special representative in Metropolitan Detroit, **Columbia Steel & Shafting Co.,** Pittsburgh.

Henry W. Koester, transferred to Los Angeles office as service representative, **Giddings & Lewis Machine Tool Co.**

OBITUARIES

Elliott W. Beckett, executive representative, until his retirement in December 1953, Continental Can Co., in Orlando, Fla., recently.

Frederick L. Rickmeyer, 44, chief engineer, Ventilation Div., The Swartwout Co., Cleveland.

The Iron Age
FOUNDED 1855
TECHNICAL ARTICLES

On heat treated parts—

Dimensional Control System Cuts Finishing Costs

◆ Low finishing costs on heat treated precision steel parts are possible through close control of rough machined dimensions . . . Too much stock allowance for size change and distortion during heat treating means unnecessary metal removal . . . Too little allowance means reject parts.

◆ Control to achieve minimum finish costs at this roller bearing plant starts with standardized steel structures and heat treating cycles . . . Next step is to chart maximum, minimum and mean values of growth and distortion occurring during the standard cycles . . . Combining these values wherever they apply gives an exact, economical stock allowance for any size part.

By: **L. L. McArthur,**
Chief Metallurgist

E. H. Kinne,
Asst. Supervisor
Rollway Bearing Co.
Syracuse, N. Y.

◆ MINIMUM FINISHING COSTS on precision roller bearing parts are achieved at the Rollway Bearing Co. by a dimensional control system which pinpoints the exact amount of finishing stock needed to compensate for dimensional changes and distortion during heat treatment.

At the company's Syracuse, N. Y., plant master charts are used to list correct stock allowances for the many sizes and types of bearing parts heat treated daily. These allowances are assigned each part before rough machining begins. Too large an allowance would mean costly extra finishing after heat treating, while too little would result in undersized or out-of-tolerance rejects after grinding or straightening.

These total or "net" stock allowances were calculated after carefully measuring hundreds of bearing parts following standard heat treatment cycles. Dimensional and distortion changes were plotted on curves denoting the minimum, maximum and mean effects to be expected according to part size, alloy material and the particular heat treating cycle.

The firm's bearings are built for hundreds

HYDRAULICALLY-operated device straightens races which exceed tolerances.

"Finishing allowances were averaged from repeated test runs to check size and distortion . . ."

of applications and necessarily differ in alloy composition, required metallurgical structure, size, weight and design. Rigid specifications must be met for each type. Some are case hardened while others are hardened throughout. Some heat treated sections require finish grinding, but other areas, which will not be finish ground, must conform to specified dimensional tolerances even after heating and quenching.

Accurate heat treatment of diversified production lots of roller bearing parts depend upon: Proper metallurgical structure; systematic furnace atmosphere and temperature control; and specific quenching techniques.

Standardization and control actually start with the bearing steels used. Components which are to be carburized are machined from SAE 8620. Where through-hardening is required on rollers, races and certain plate sections, a straight or modified SAE 52100 steel is used.

Just as standard furnace cycles are established for heat treating at Rollway, so is all quenching standardized with oil. The oil is stored in a central tank for circulation and agitation in individual quench tanks. As a prime control factor, quench oil is maintained in a temperature range of 125 to 130°F. At this temperature, oil viscosity is less and its heat transfer properties are increased.

Large bearing components are quenched several to a grate or singly, with the aid of cranes in both cases. Smaller sections are hooked to special fixtures and quenched in a vertical position to prevent the formation of gas pockets and to minimize distortion.

Delayed quenching is applied to thin section parts to prevent warping. For example, a ring with a 30-in. OD, a 28-in. ID and ½-in. thick section would be oil quenched from 500 to 600°F, removed for fastening to a stationary quenching fixture and again quenched to 125°F.

Press quenching with dies is used whenever part size and distortion can be controlled to within a few thousandths of an in.

All work to be through-hardened is tempered in special furnaces at 385°F. Depending on the mass involved, tempering may take up to 25 hr.

To minimize subsequent finishing costs, the effect of each heat treat process upon the surface, physical size and distortion of a particular bearing part must also be determined and constantly controlled.

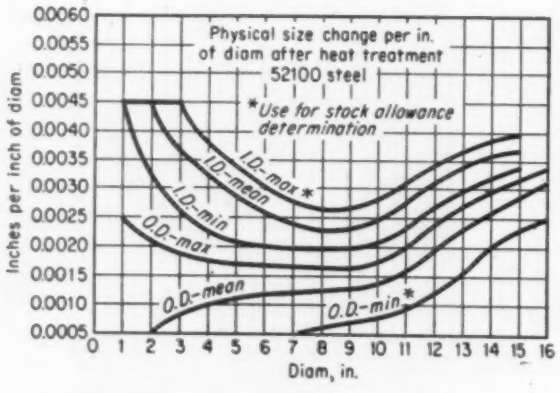
Three allowances for each part

Rollway has solved these problems by establishing economical finishing allowances that apply to bearing parts in any combination of diameter, length or section measurement. Each set of allowances was averaged from repeated test runs to check size and distortion changes.

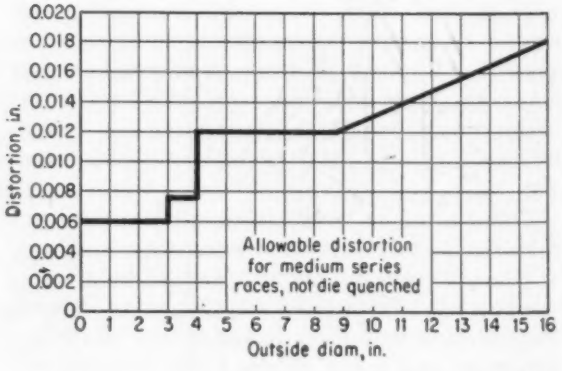
All test runs were made in accordance with established procedures. A typical test used about 50 bearing races which were numbered, measured with micrometers, then heat treated. After quenching and tempering the parts were again measured.

These measurements indicated the maximum, mean and minimum size and distortion changes that could be expected on production runs. Besides forecasting minimum stock allowances for

ALLOWANCE CURVES FOR BEARING PARTS



SIZE CHANGE curves for parts made from each alloy help to figure total stock allowance.



DISTORTION allowances for bearing parts are essential in planning for low cost finishing.

BEARING rollers to 1/2-in. diam are carburized in a rotary retort, quenched in a floor tank.

grinding and finishing operations, such measurements also indicated whether the heat treat process would maintain size tolerances on those bearing part areas which are not finish ground.

Three separate allowances for each bearing part are made in order to: (1) remedy original rough machined surfaces; (2) compensate for growth or physical size change; (3) allow for distortion effects. The first allowance, to remedy surface coarseness resulting from preliminary facing, boring or turning operations, has become a rule of thumb. It is broken down as follows into three classes, based upon the part OD. Up to 4¾ in., OD and ID allowances are 0.004 in. From 4¾ to 16 in., they are 0.006 in. and from 16 to 30 in., they are 0.008 in.

The second allowance, for growth or physical size change, is determined by first designating three broad groups based on the steels used in Rollway bearings: (1) SAE 8620 for carburizing; (2) SAE 52100 for through-hardening (3)

STOCK ALLOWANCE MASTER CHART—MATERIAL SAE 52100

MAXIMUM LENGTH	ONE INCH				ONE + 1/2 IN.				TWO INCHES				TWO + 1/2 IN.			
MAXIMUM SECTION	1/8	1/4	3/8	1/2	1/8	1/4	3/8	1/2	1/8	1/4	3/8	1/2	1/8	1/4	3/8	1/2
OUTSIDE DIAM																
1/2 IN. TO 1 IN.																
1 IN. TO 1 1/2 IN.																
1 1/2 IN. TO 2 IN.																
INSIDE DIAM																
1/2 IN. TO 1 IN.																
1 IN. TO 1 1/2 IN.																
1 1/2 IN. TO 2 IN.																

modified SAE 52100 alloys for other parts to be through-hardened. By using size-change data obtained from numerous test runs, values for the maximum, mean and minimum changes in OD and ID are plotted for each type of steel as shown in Fig. 1. These physical size change allowances are charted for all sizes of bearing races made from the three types of steel.

Distortion allowances are calculated in much the same manner as allowances for physical growth. Distortion effects upon OD, ID, length and section of each bearing component are measured and analyzed. Resultant allowances are plotted in terms of thousandths of an in. vs. bearing race OD in in., as shown in Fig. 2.

The separate allowance for rough surface condition, physical size change and distortion are finally totaled for quick, positive reference on master stock allowance charts set up in columnar form. As shown in Fig. 3, the vertical column at the extreme left of the chart is broken down into half-inch increments for OD and ID measurements. A horizontal header column groups maximum section dimensions in eight-inch steps under each major length column.

Calculating the total stock allowance for a 10-in. OD by 9-in. ID bearing race offers an example of how master chart is filled in. The standard OD and ID machining allowance for this race would be +0.006 in. Curves similar to those in Fig. 1 show the OD and ID physical size change allowances to be +0.003 in. and +0.0198 in., respectively. Similarly a distortion allowance curve for both OD and ID would indicate +0.013 in. as the allowable value for this size race in the type of steel used.

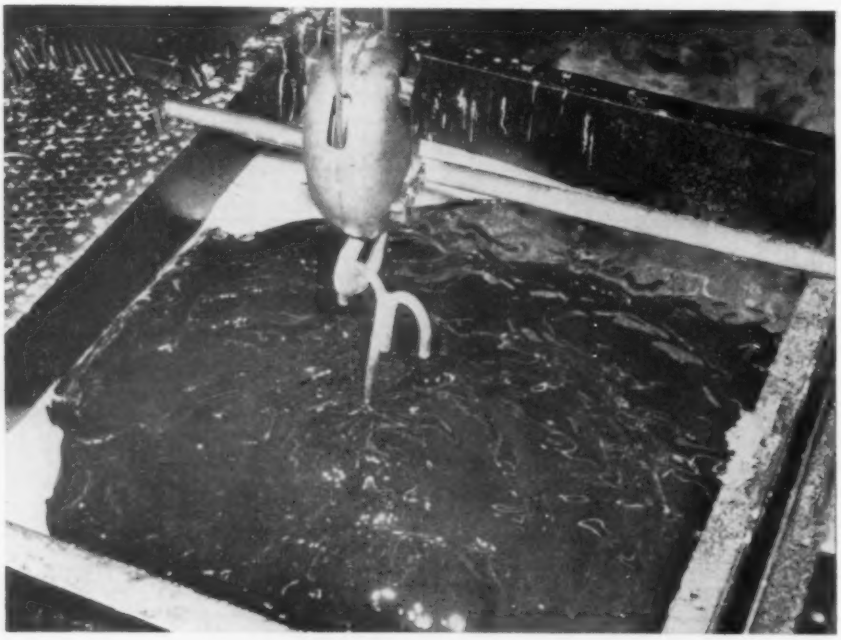
By combination, final stock allowance for this 10-in. OD race would be the total of the three allowance factors, minus the gain in OD due to physical size change in heat treatment. Using figures, (0.006 in. + 0.003 in. + 0.013 in.) − 0.003 in. = 0.019 in. This net result represents a nominal stock allowance to which, in effect, is added a positive machining tolerance.

By similar combination, stock allowance for the 9-in. ID is a total of only two allowance factors, physical size change and distortion. Using figures, (0.0198 in. + 0.0130 in.) = 0.0328 in. A machining allowance is not considered in the ID total since the physical size change allowance cancels out the effect of the machining allowance. Thus the net stock allowance for a 9-in. ID remains at 0.0328 in. with a negative machining tolerance.

Values placed in chart

When calculated as described, these total stock allowance values are placed in their proper chart columns under the OD heading (10-in. OD by 3½-in. length by ½-in. section) and under the ID heading (9-in. ID by 3½-in. length by ½-in. section).

With all the chart columns filled in as a result of similar calculations, necessary stock allowances can be immediately determined for any combination of diameter, length and section for any bearing race to be heat treated.



CIRCULATING pumps draw oil from quench tank bottoms, force it upward for more agitation.

Morale builder—

Air Conditioned Rest Areas Boost Worker Productivity

◆ Cost of air-conditioning rooms where workers can take a breather after hot, humid work periods is minor compared to possible production gains . . . High temperatures and humidity in work areas cause a high pulse, even a slight fever in the average worker . . . At heart rates over 110 beats per minute, fatigue and complaints go up.

◆ Short air conditioned rest periods spaced through the working day help workers return to "normal" . . . Where entire working areas cannot be air conditioned, forced air circulation helps keep the heart rate down.

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◆ SHORT REST PERIODS in air-conditioned "recovery rooms" several times a day can help make workers who labor in temperatures up to 156°F as productive and generally happy and healthy as those who work at ordinary temperatures.

And for companies seeking higher production, less absenteeism and a lower rate of employee turnover, the cost of air-conditioning such rest areas is negligible compared to the savings that can be realized.

The foregoing conclusions are based on several years of research for the du Pont Co. and the Aluminum Co. of Canada, Ltd. The project was started in 1945 at the four smelting plants of the Canadian firm. Purpose was to determine the effect of environmental temperatures and humidity on heart rate recovery, an important key to workers' health and productivity. The research also helped chart the effect of work area temperatures on employee morale.

From the studies, still being carried on and expanded, have come a mass of statistics indicating that air-conditioning, even on a partial scale, represents a good investment for industrial plants.

Without disclosing production increases, officials of the Aluminum Co. said savings far outweighed the cost of the air-conditioning installed in their Canadian smelters. A sharp drop in absenteeism and rate of turnover among employees also followed adoption of air-conditioning recommendations.

Work conditions simulated

Test groups used in all of the Canadian experiments included company employees and male university students. Students were chosen so that certain tests could be conducted without interrupting production. Physical work assigned the test group was controlled to duplicate, in energy expenditure, that usually performed by smelter employees. Temperature and humidity conditions were set up to duplicate those in a typical foundry or power plant boiler room, and also for average summer conditions in a normal manufacturing plant.

All tests were designed to measure body temperature and heart rates before and after a controlled work period. Every test was repeated ten times under identical conditions to provide an accurate norm. Students were acclimatized

An easy job seems like a hard one when humidity increases slightly at 100°F and higher . . .

to heat by working in various temperatures for one month before actual tests were started.

Before each test, subjects rested for one-half hour at normal room temperatures of 72°-75°F. They then entered the test room and sat quietly for 10 minutes before beginning the physical exertion cycle.

Fig. 1 shows the effect upon the heart of moderate work under varying heat conditions, with relative humidity of about 25 pct. Subjects stepped upon an eight-inch platform and down again, repeating the procedure 30 times per minute for five minutes. They then sat down to rest in the test room, and for three minutes their heart recovery was measured at one minute intervals.

Results in Fig. 1 indicate a sharp increase in heart rate as the work area temperature increases; also with higher working temperatures, heart rates show less tendency to return to normal.

For example, average heart rate after performing the platform-step test in normal 72°F temperature was 83 beats per minute after the first minute of rest. Three minutes after the five-minute work stint, average heart rate was back to a normal 75 beats per minute. But subjects tested in average temperatures of 156°F wound up the first minute of the post-work rest period with a heart rate of 136 beats per minute, and at the end of the three-minute rest period, their heart rate was still 130 beats per minute.

Results of these laboratory tests were later verified in actual plant checks by counting heart rates during a rest period following the first hour of work for the day.

Additional plant tests showed that with each successive work period during the day, the heart recovery rate became slower, so that at the end of the eighth cycle the heart would be beating much faster than at the end of the first work hour. This was true even at lower working area temperatures, as shown in Fig. 2.

Interestingly enough, at a work temperature as low as 40°F, the heart rate remained much nearer normal throughout the eight-cycle day than it did when the average working temperature rose to 82°F.

Especially interesting is the position of the various curves in relation to the 110 beats per min line. That line represents the workers "gripe" boundary. So long as their heart rate did not register above 110 beats per minute, at one-minute recovery, they had no complaints about working conditions. But above the 110-beat rate, workers began complaining about the heat, condition of the air within the work area, amount of work, etc.

Digestion increases heart rate

Complaints increased in direct ratio to the increased heart beat rate with a consequent decrease in worker efficiency and productive output. Even an hour lunch period for the 82°F workers, and a 45-minute lunch period for the group working in 40°F temperatures, did not bring their heart rate back to normal. One reason, of course, is that the digestive process naturally increases the heart rate.

Humidity is as important as temperature in

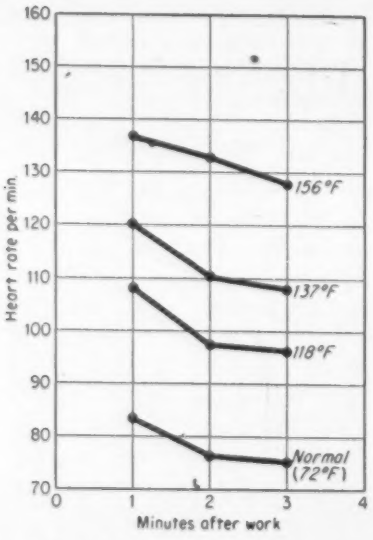

FIG. 1—Heart rate recoveries after 5 min of moderate work at various temperatures.

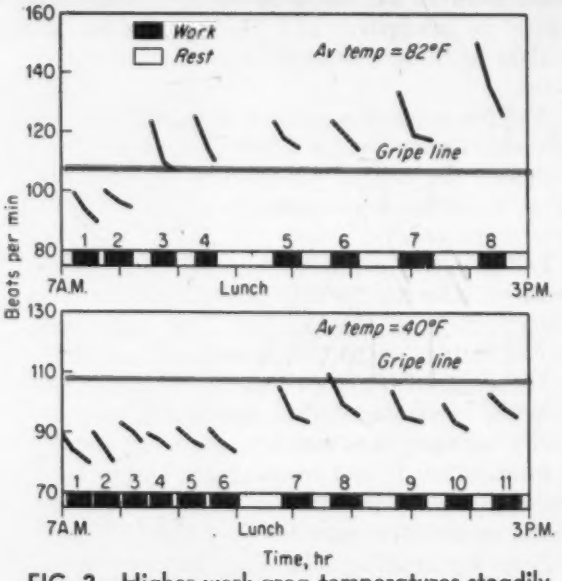

FIG. 2—Higher work area temperatures steadily push heart rates above the "gripe" level.

determining heart rate recovery when the temperature is above 80°F dry bulb. Under such conditions body cooling is limited by the ability to perspire and also by ability of the atmosphere to vaporize perspiration. At air temperatures around 100°F and above, a small increase in humidity can greatly modify the physiological effects of environment and change a relatively easy job into a hard physical performance.

High humidity slows heart recovery

The effect of humidity on heart rate recovery at temperatures above 80°F dry bulb is shown in Fig. 3. With a constant temperature of 99°F, and humidity of 56 pct, strain on the average worker's heart was not unduly severe. And within three minutes after ceasing work the heart rate returned to less than 90 beats per minute. But a relative humidity of 80 pct at the same 99°F temperature was much harder on the heart. Although recovery during the first two minutes was more rapid at the higher humidity, workers never regained as low a heart rate level after three or more minutes rest as did the laborers who worked 56 pct humidity conditions.

Economically it would not be practical to air-condition most high-temperature, high-humidity plant areas for worker comfort. But by air-conditioning a small room where laborers can rest between work periods, much of the health benefit of total air-conditioning could be achieved at a fraction of the expense.

Exposure to adequately controlled temperature-humidity conditions during properly spaced rest periods enables the worker to return to his basic resting level and reduce his physiological stress and fatigue considerably, these studies have shown.

Fig. 4 compares heart recovery rates after similar work conditions but with rest conditions at two different temperature-humidity levels. The solid lines represent smelter workers who rested in a non air-conditioned room after each work cycle of about an hour. Dotted lines show the heart recovery rate when the same workers rested in an air-conditioned room at 85°F, with humidity 40 to 45 pct.

Subjects were tested both after work and after a prolonged rest. In both cases, air-conditioning resulted in a much better heart recovery. But the difference in heart rates indicates that even when no physical effort is involved, control of temperature and humidity means less work for the heart.

To avoid an unpleasant chilling sensation when moving abruptly from a hot area to a much cooler one workers should be permitted to regulate the temperature of their rest area to suit daily conditions.

Moving air helps heart rate

No salt tablets were administered in any of these tests, but plenty of cold drinking water is important in helping workers counteract heat effects.

Simple air movement alone, without mechanical control of temperature or humidity, is often a big help in reducing physiological stress. An experiment at the du Pont Company showed that creation of a nine-mile per hour breeze through the work area reduces the heart rate about 10 pct. This test was conducted at 90°F and 65 pct relative humidity, but other studies indicated the same conclusions would apply to several combinations of high temperature and humidity.

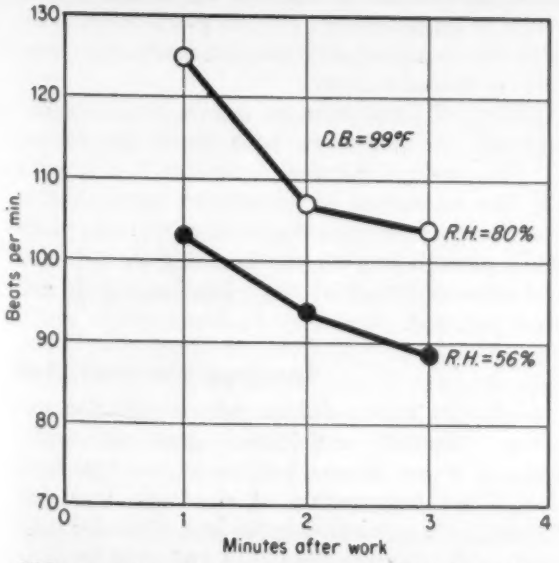

FIG. 3—At constant temperature, high humidity means a slower rate of heart recovery.

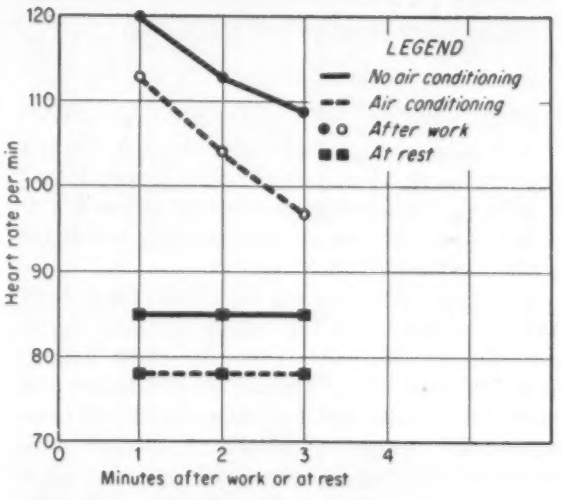

FIG. 4—Air conditioning, whether after work or at complete rest, means lower heart rates.

Properties change—

How Radiation Affects Structural Materials

Part I

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◆ Radiation affects both mechanical and physical properties of materials used in nuclear reactors . . . As reactors come into use for peacetime power, engineers and metallurgists will have to consider these factors in the production of basic materials and in design of reactor components.

◆ Materials generally show higher yield strength, lower percentage elongation and somewhat higher ductile-brittle transition temperatures . . . Degree of change seems tied to flux intensity and exposure temperature . . . Hardness increases are more noticeable in materials which start soft . . . Hardness effects are annealed when exposure temperatures are higher.

◆ MECHANICAL AND PHYSICAL properties of metals used in nuclear reactors are affected by irradiation. These effects must be considered in both the design and production of basic materials and the many components peacetime power reactors will require.

A number of common materials have been studied to determine the extent of these radiation effects: Materials generally show higher yield strengths, lower percentage elongation and somewhat higher ductile-brittle transition temperatures. Samples irradiated at higher temperatures, due to annealing or tempering that takes place, are changed less than those irradiated at room temperature.

In tests on plain carbon and stainless steels, softer materials showed greater hardening due to irradiation than harder materials. Radiation damage was not found to be a function of carbon content. The effects of irradiation are preserved at room temperature. Irradiation effects proceed at a decreasing rate and probably approach a limit well below the fully embrittled condition.

Reactor operation imposes unusual conditions on materials of construction. One such condition is the effect of a charged particle of high velocity penetrating matter, colliding with the nuclei of atoms in its path. If the energy lost in a collision is large, an atom in the bombarded material is displaced from its lattice position. A small percentage of random disturbances may result in large changes in mechanical properties, with the changes being proportional to the fraction of displaced atoms.

Effects of irradiation on metals are somewhat analogous to cold work with these exceptions: (1) The mode of damage production is different; (2) the magnitude of irradiation hardening is less than in cold work hardening; (3) the radiation effect is applied on an extremely localized and microscopic scale; (4) radiation effects are nondirectional.

Specimen size restricted

In studies such as these, where radiation exposures simulate anticipated operating conditions, it is not always possible to use standard tests. Sizes and numbers of specimens were restricted by reactor-test space and time requirements. In-pile measurements and post-irradiation measurements on radioactive specimens are difficult to perform.

Types and dimensions of specimens used are shown on p. 130. Identical unirradiated con-

TABLE I

HOW IRRADIATION AFFECTS HARDNESS PLAIN CARBON STEELS

Material	Condition	Flux Data	Temp. Deg. F	Hardness, Rockwell		
				Scale	Before	After
SAE-1018	Annealed	(1)	450-500	C	6-7	8-10
	Annealed	(1)	450-500	B	81-83	85-87
	Hardened	(1)	450-500	C	20-25	22-25
	Annealed	(2)	70-140	B	76-78	84-85
	Hardened	(2)	70-140	C	22	23
SAE-1042	Annealed	(1)	450-500	C	14	15
	Annealed	(1)	450-500	C	21-23	27-29
	Hardened	(1)	450-500	C	45-46	46-48
	Annealed	(2)	70-140	C	18-21	9-10*
	Hardened	(2)	70-140	C	40-45	45-46
SAE-1045	Annealed	(3)	70-80	B	89-91	88-91
	Hardened	(3)	70-80	C	52	37-43**
SAE-1095	Annealed	(1)	450-500	C	31-32	33
	Hardened	(1)	450-500	C	53-55	54-55
	Annealed	(2)	70-140	C	29-32	33-34
	Hardened	(2)	70-140	C	53-54	53-54
SAE-1113	Annealed	(1)	450-500	C	12	16-18
	Hardened	(1)	450-500	C	9-13	11-13
SAE-1141	Annealed	(1)	450-500	C	12-20	25-26
	Hardened	(1)	450-500	C	45	45-47

trol specimens, held under similar conditions of temperature and surrounding medium, were tested at the same time. Standard testing equipment was adapted for restricted space use and remote control manipulation.

To determine the effects of radiation intensities, exposures are measured in *nvt*, where: n = neutrons per unit volume in incident beam; v = neutrons velocity; t = exposure time. The quantity *nvt*, the integrated flux, is the number of neutrons incident per unit area for the time the specimen is exposed. Both slow and fast integrated flux figures are included for most tests. Slow neutrons have energies of approximately 1/40 electron volts (ev). Fast neutrons have energies at least greater than 1 mev or 10^6 times that of the slow neutrons. The range of neutron energies is generally considered from 10^{-3} to 10^7 ev.

In testing hardness, annealed and hardened (quenched and tempered) specimens, 3/8 in. in diam x 3/4 in. long, of several plain carbon steels, Table I, were irradiated. A before and after comparison indicates an increase in hardness depending on initial hardness of the material.

Selected stainless steels, initially treated to varying degrees of hardness, were irradiated under various temperatures and flux intensities. The effect of irradiation on hardness, Table II, was (a) insignificant on hardened materials; (b) usually small on semi-hard materials; and (c) reflected in increases on soft and annealed materials. Increases on soft materials ranged from 10 to 15 points R_B and 10 points R_A except where temperature was sufficient to reduce the effects of irradiation.

Nickel-base metals such as Hastelloy-C (cast and wrought), Monel, K-Monel, Inconel, and Inconel-X, were irradiated dry and in flowing

TABLE II

STAINLESS STEELS

Material	Condition	Flux Data	Temp. Deg. F	Hardness, Rockwell		
				Scale	Before	After
304	Annealed	(4)	400-500	B	72-76	72-76
	Malcomized	(5)	70-80	15N	89-91	93-95
309	Annealed	(4)	400-500	B	81-83	81-85
316	Annealed	(5)	70-80	B	82-83	88
	Annealed	(4)	400-500	B	78-80	78-79
	Cold Worked	(5)	70-80	C	25-27	28-32
329	Annealed	(6)	540	A	50-53	50-54
347	Annealed	(6)	540	B	89-90	81-90
	Malcomized	(7)	.....	15N	89-92	87-91
	Annealed	(4)	400-500	B	81-83	81-83
347A	Annealed	(6)	540	A	50	54-55
	Shot Peened	(6)	540	A	49-51	52-54
410	Malcomized	(5)	70-80	15N	90-91	90-94
	Malcomized	(7)	.....	A	81-83	82-83
	Malcomized	(8)	.....	15N	91-92	92
431	Annealed	(6)	540	A	64-65	66
	Hardened	(6)	540	A	70-71	72
440 C	Hardened	(8)	.....	A	75	77-79
	Hardened	(5)	70-80	C	54-55	53-55
	Hardened	(8)	.....	C	56-57	58-59
	Malcomized	(7)	.....	15N	88-89	85-96
442	Annealed	(6)	540	A	53-57	59-61
446	Hardened	(6)	540	A	57	61-63
U.S.S. "W"	Hardened	(5)	70-80	C	46-49	47-49
	Hardened	(6)	540	A	73	74
Armco 17-4 PH	Annealed	(9)	540	C	33-35	48-52
	Hardened	(6)	540	A	73	74
	Hardened	(9)	540	C	43-44	44-48
Armco 17-7 PH	Hardened	(6)	540	A	73	75
	Hardened	(9)	540	C	50-51	45-50
	Malcomized	(6)	540	15N	92	95

TABLE III

NICKEL AND NICKEL-BASE ALLOYS

Material	Condition	Flux Data	Temp. Deg. F	Hardness, Rockwell		
				Scale	Before	After
Nickel A	.....	(1)	.....	F	84-78	82-91
Hastelloy C	Cast	(10)	.....	A	60-61	69-70
	Cast	(10)	.....	A	57-58	60-61
	Wrought	(1)	400-500	C	25	30
	Wrought	(6)	70-140	B	94-96	92-95
	Wrought	(11)	540	C	24-27	27-30
Monel	.....	(8)	70-140	B	81	95
	.....	(11)	540	B	82-84	86-91
K-Monel	.....	(8)	70-140	C	26	30
	.....	(11)	540	C	24-26	25-28
K-Monel	Annealed	(6)	540	A	49-50	53-56
	Hardened	(6)	540	A	68-69	69
Inconel	.....	(8)	70-140	B	88	100
	.....	(11)	540	B	89-90	93-102
Inconel-X	.....	(8)	70-140	B	95	104
	.....	(11)	540	B	94-99	99-104

* No explanation for decrease in hardness values.

** Decrease in hardness due to corrosion products caused by leaking container.

Integrated Flux in nvt: (1) 1 x 10^{19} slow; (2) 2 x 10^{19} slow and 7 x 10^{18} fast; (3) 3 x 10^{20} slow and 1 x 10^{20} fast; (4) 1.2 x 10^{19} slow; (5) 3.7 x 10^{20} slow and 5.1 x 10^{20} fast; (6) 3 x 10^{19} slow; (7) Dry at 10^{19} slow; (8) 5 x 10^{19} slow and 4 x 10^{19} fast; (9) 4.4 x 10^{19} slow; (10) 4 x 10^{19} slow and 5 x 10^{19} fast; (11) 4 x 10^{19} slow.

water, at room temperature and at temperatures to 540°F. All showed an increase in hardness. The amount of hardness increase, Table III, was less as temperature increased.

Duplicate specimens of the cobalt base alloy, Stellite 3, were irradiated dry. Pre-irradiation hardness values were Rc 52 and Rc 45. Post-irradiation hardnesses were Rc 53 to 55 and Rc

Sizes and numbers of specimens are restricted by reactor test space, time requirements.

49 to 51. Haynes Alloy 25 increased in hardness from RA 61-62 to RA 62-63 when irradiated in flowing 540°F water at 3 x 10^{19} nvt slow.

Four specimens, two of type 347 stainless and two of Nickel A, were chromium plated 0.005 in. on all surfaces. These were irradiated under flowing 540°F water at 3 x 10^{19} nvt slow. Increases in hardness of the surface platings ranged from 0 to 6 points Rockwell 45-T.

Two titanium specimens increased from RA 62-63 to RA 63-64; two other titanium specimens increased from RA 57 to RA 61. Irradia-

TABLE IV

TENSILE PROPERTIES OF STAINLESS

Material	Condition	Ultimate Tensile Strength, psi	Yield Strength, 0.2 Pct Offset psi	Elongation In 2 In., Pct
304	Irradiated	92,000	43,500	58.5
	Irradiated	95,500	48,500	41.0
	Unirradiated	92,500	44,000	70.8
309	Irradiated	99,000	43,500	51.0
	Unirradiated	95,000	38,500	54.0
316	Irradiated	89,500	36,500	66.5
	Unirradiated	90,000	35,000	70.0
347	Irradiated	103,000	42,500	54.5
	Unirradiated	99,000	37,500	56.6

(1). Flat tensile specimens 7.3 in. long by 0.07 and 0.15 in. thick with 0.5 in. gage width. Calculated nvt of 1 x 10^{19} slow at 400°–500°F.

Reported by Oak Ridge Metallurgy Div.

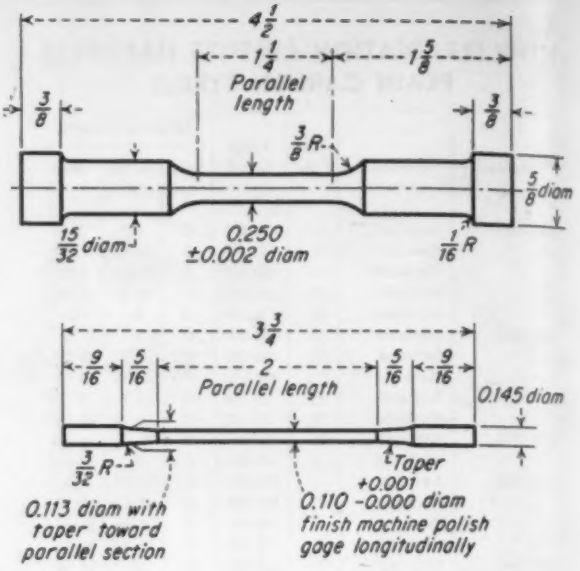
TABLE V

TENSILE STRENGTH OF STAINLESS

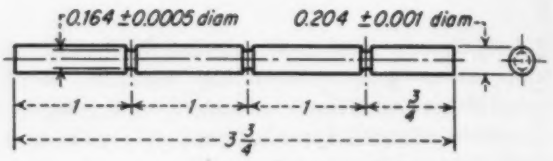
Material, Type and Treatment	Ultimate Tensile Strength, psi		Yield Strength, 0.2 Pct Offset, psi	
	Unirradiated	Irradiated	Unirradiated	Irradiated
316, Annealed(1)	79,500	151,000	.....	.....
U.S.S. Type "W"(1)	113,000	134,500	.....	.....
410, Malcomized(2)	69,000	70,000	47,000	62,000
410, Malcomized(2)	70,000	75,000	44,000	61,000
440C, Hardened(2)	199,000	240,000	185,000	205,000
440C, Hardened(2)	211,000	240,000	185,000	200,000

(1) Exposure with nvt of 3.7 x 10^{20} slow and 5.1 x 10^{20} fast at 70°–80°F.

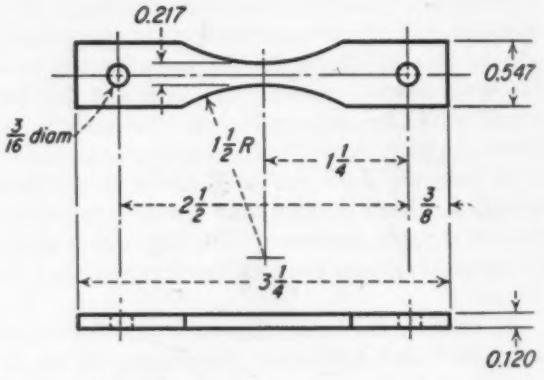
(2) Exposure with calculated nvt of 4 x 10^{19} slow and 5 x 10^{19} fast.



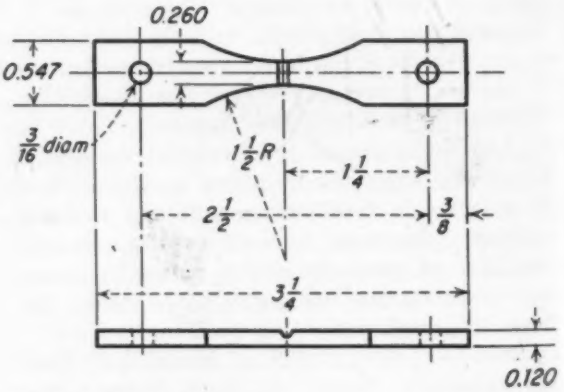
Tensile



Impact



Unnotched Fatigue



Notched Fatigue

tion exposure was the same as for the chromium-plated cylinders.

Flat tensile specimens of annealed stainless steel types 304, 309, 316, and 347 were irradiated in flowing water at temperatures between 400° and 500°F. Calculated slow flux exposure was 1×10^{19} nvt. Results of tensile tests, Table IV, indicated rediation-damage effects were annealed by the ambient temperature. Yield and ultimate strengths increased slightly and ductility decreased slightly. The difference in elastic-modulus were within the accuracy of the experiment.

Round tensile specimens were used to evaluate the effect of irradiation on several types and conditions of stainless steels. The results, Table V, indicate an increase in material strengths due to the effects of irradiation. The degree of increase appears related to the original condition, or hardness, of the material rather than to chemical analysis or method of hardening.

The effect of irradiation on the tensile properties of nickel-base alloys, Monel, K-Monel, Inconel, Inconel-X, and wrought Hastelloy-C is shown in Table VI. These alloys were irradiated at 540°F for a calculated integrated slow flux of 4×10^{19} nvt. The Hastelloy-C appeared to be affected more by temperature aging than by irradiation. The effects of irradiation on Monel, K-Monel, Inconel, and Inconel-X probably were reduced somewhat by the annealing effects of the 540°F operating temperature.

Notched and unnotched tensile specimens were machined from five nickel alloys and irradiated dry. Irradiation was at 6×10^{19} nvt slow and 4×10^{19} nvt fast at temperatures between 70° and 140°F. Tests results, Table VII, indicate tensile strengths increased from 3 to 13 pct on unnotched specimens, and from 6 to 11 pct on notched specimens. Irradiation reduced ductility except for Inconel specimens.

TABLE VI

TENSILE PROPERTIES OF NICKEL-BASE ALLOYS

		Notched Specimens		Unnotched Specimens	
Material	Condition[1]	Elongation in 2 in., Pct	Tensile Ultimate, psi	Elongation in 2 in., Pct	Tensile Ultimate, psi
Monel	Unirradiated	2	127,500	31	86,000
	Unirradiated	2	131,000	34	87,500
	Irradiated	1	133,500	29	91,500
K-Monel	Unirradiated	1	212,500	12	127,000
	Unirradiated	1	209,000	9	124,000
	Irradiated	2	195,000	19	133,500
Inconel	Unirradiated	1	148,000	33	108,500
	Unirradiated	2	153,000[2]	28	107,500
	Irradiated	2	160,000	29	113,000
Inconel-X	Unirradiated	2	173,000	38	129,500
	Unirradiated	2	175,000	35	128,000
	Irradiated	1	198,000	35	139,000
Hastelloy-C	Unirradiated	1	204,000	21	142,000
	Unirradiated	–	192,000	19	138,500
	Irradiated	2	191,000	36	137,000

(1) Unirradiated specimens stored in air at room temperature to accentuate effects of irradiation and in-pile corrosion. Irradiated specimens exposed in 540°F flowing water for a calculated nvt of 4×10^{19} slow.

(2) Prestressed before testing to approximate irradiation effects.

EDITOR'S NOTE—Mr. Leeser, now with the Detroit Edison Co., was formerly Associate Metallurgist, Reactor Engineering Div., at Argonne National Laboratory. The article is based on a paper presented by the authors at the recent International Congress On Nuclear Engineering, sponsored by the American Institute of Chemical Engineers and held at Ann Arbor, Mich.

TABLE VII

TENSILE PROPERTIES OF UNNOTCHED NICKEL ALLOYS EXPOSED IN DRY SEALED CONTAINERS

		Ultimate Tensile Strength, psi			Elongation in 2 in., Pct	
Material	Specimen Type	Unirradiated	Irradiated	Increase, Pct	Unirradiated	Irradiated
Monel[1]	Unnotched	85,000	96,000	13	33	10
	Notched	129,000	Erratic	....	....	....
K-Monel[1]	Unnotched	123,000	134,000	9	11	3
	Notched	211,000	226,000	7	....	....
Inconel[1]	Unnotched	106,000	116,000	9	31	29
	Notched	151,000	172,000	14	....	....
Inconel-X[1]	Unnotched	126,000	133,000	6	37	23
	Notched	174,000	203,000	17	....	....
Hastelloy C[1] (Wrought)	Unnotched	138,000	142,000	3	20	12
	Notched	198,000	220,000	11	....	....
Hastelloy C[2] (Cast)	Unnotched	76,000	104,000	37	....	....
	Unnotched	85,000	111,000	31	....	....

[1]Nvt = 5×10^{19} slow and 4×10^{19} fast. Cooling water at 70°–140°F.
[2]Nvt = 4×10^{19} slow and 5×10^{19} fast.

Imported byproduct—

Develop New Source fo

◆ A byproduct from the processing of electrolytic sheet iron provides the raw material for a new source of electrolytic iron powder . . . Fragments broken from the cathode sheet during handling have high purity . . . They are converted into a powder with an apparent density of 2.34 to 2.38 g per cc . . . Sieve analysis is comparable to commercial grades.

◆ Tests on the powder indicate its suitability for the production of high density, high strength parts . . . High green strength permits molding and handling of difficult parts with less danger of fracture in the green state . . . Semiproduction quantities of the powder have been made and are now being tested by users.

By R. N. Okuno, Vice President, Takamine Overseas, Inc., New York

L. H. Mott, Senior Research Engineer, Stevens Institute of Technology, Hoboken, N. J.

◆ RECENT ADVANCES in powder metallurgy have made possible the commercial production of high strength metal powder parts. Previously, the products of powder metallurgy were considered relatively weak, showed little ductility and, with the exception of the refractory metals, were classified strengthwise with cast iron.

Today, strengths exceeding 60,000 psi have been recorded with ductility values exceeding 10 pct. New press and furnacing facilities and greater experience in die design have greatly expanded the range of metal powder applications.

Wider application of metal powder parts has resulted in an increased demand for sources of raw material and processed powders of all kinds, particularly in the field of ferrous powder. To meet this growing demand, a new source of electrolytic iron powder has been developed by Takamine Overseas, Inc., in cooperation with the Showa Denko Industries in Japan.

Fragments form raw material

Showa Denko K.K. produces an exceptionally pure electrolytic sheet iron by a new patented process. The process produces, as a byproduct, fragments broken from the cathode sheet during handling which have the high purity of the sheet but are too small for processing.

These fragments form the raw material from which the electrolytic iron powder is made.

Initial development work was carried out using a 500-lb sample of the fragments. The first objective was to investigate cammination of these fragments into powder form. A series of tests were conducted in the experimental grinding laboratory of a well-known manufacturer of milling and grinding equipment. Results indicated that if the size of the imported fragments exceeded 2 to 3 sq in., a three-stage grinding operation, consisting of a prebreaking step, hammer milling step and final grinding step would be necessary. Showa Denko K.K., informed of the tests, arranged to supply material in the hammer milled condition having a maximum particle size of approximately ¼-in. cakes.

Final grinding of the product was done in a Williams Roller Mill. The mill speed, air draft, etc., were varied during the preliminary grinding tests until the resultant product attained an apparent density of 2.34 to 2.38 g per cc with a sieve analysis comparable to commercial grades.

The particle shape obtained by the milling process was irregular and slightly circular in character. There was very little evidence of flaking since the raw material was very hard and had closely knit dendritic structure.

Tests were then run to determine the effect of annealing temperature upon both the powder proportion and the mechanical properties of the pressed and sintered powder. During the first tests, the time of annealing was held constant at 1 hour and samples were annealed at 1292°, 1472° and 1652°F. As shown in Table I, the optimun temperature of anealing for this length of time was 1472°F. Later experiments showed that essentially the same result could be obtained by

for Electrolytic Iron Powder

raising the temperature to 1900°F and reducing the annealing time to 15 min at heat.

The data obtained from the 500-lb sample, was sufficiently encouraging to warrant an order for a larger quantity of fragments so that pilot plant operation could be determined. A 20-ton heat was received and processed in accordance with previous procedures. The entire heat was pulverized in a roller mill and annealed in a roller hearth furnace. The powder was spread to a depth of about 1 in. on stainless steel pans which had been previously slightly oxidized to prevent the powder from sintering to the pan during annealing.

High green strength

After removal from the sintering furnace, the annealed cake was prebroken in a drum type crusher and repulverized in a high speed (7200 rpm) hammer mill. By proper control over the repulverizer speed and the rate of feed into the mill, it was found that the properties of the resultant powder could be closely controlled.

Chemical analysis, powder characteristics and mechanical properties obtained on a typical grade of the powder are shown in Tables II and III.

The powder appears to be particularly suitable for the molding of high density, high strength parts at reasonable compacting pressures. One desirable characteristic of the powder is its excellent green strength which permits molding and handling of complex components having thin appendages with less danger of spoilage by fracture in the green state.

No lubricant used

No lubricant was used in fabricating the specimens from which the data shown in Tables II and III were taken.

Since the Takamine Overseas Co. is primarily interested in importing the iron fragments, sevdomestic producers of iron powder were consulted about adapting the development work into commercial practice.

The Pyron Corp., Niagara Falls, N. Y., has processed a semiproduction quantity of the powder which was sent to users of electrolytic iron powder for evaluation. Results so far indicate the powder is competitive on the basis of powder and mechanical properties.

TABLE I

Mechanical Properties at Annealing Temperature

Compacting pressure — 25 tsi
Annealing time — 1 hr

	None	700°C	800°C	900°C
Green density, g per cc	5.53	6.09	6.35	6.37
Sintered density, g per cc	*	*	6.42	6.45
Diam change, pct	*	*	0.26	0.26
Height change, pct	*	*	0.46	0.46
Tensile strength, psi	*	15,300	17,460	17,640
Elongation, pct	*	8	10	10

* Not Determined.

TABLE II

CHEMICAL ANALYSIS

Po	less than 0.001
Al	less than 0.001
Cr	less than 0.005
Mn	0.002
Mo	0.002
Ni	less than 0.005
Si	less than 0.001
Sn	less than 0.001
V	less than 0.001
As	0.005
C	.0.04
S	0.006
Acid Insol.	less than 0.005
Fe	99.92

POWDER PROPERTIES

Apparent density	2.42 g per cc
Flow rate	37.0 sec.
Hydrogen loss	0.13 pct
Sieve Analysis:	
+100	0.20 pct
−100 +150	0.73 pct
−150 +200	5.40 pct
−200 +250	6.43 pct
−250 +325	29.10 pct
−325	58.14 pct

TABLE III

MECHANICAL PROPERTIES

Compacting Pressure	30 tons per sq in.
Sintered: 2030°F—45 min—hydrogen atmosphere	
Green density	6.31 g per cc
Sintered density	6.41 g per cc
Green strength	5,245 psi
Tensile strength	20,045 psi
Elongation	10.4 pct
Change in height	0.64 pct
Change in width	0.40 pct

Welded assemblies—

Handling Fixtures Coordinate

By Herbert Chase, Consultant, Forest Hills, N. Y.

◆ When subassembly cannot be done on a moving conveyor, use of the conveyor line need not be ruled out entirely . . . Speed and handling benefits of conveyor systems can be utilized by transfer units which carry work between the conveyors and fixed work stations.

◆ Volume production of Army cargo trailers at Checker Cab calls for fast assembly of chassis and body units . . . Synchronized conveyors carry frames and bodies to permanent work stations . . . Automatic loading and unloading units are timed for perfect transfer to work between moving conveyor lines and work fixtures.

◆ INGENIOUS LOADING and unloading devices carry bulky chassis and body components back and forth between permanent work fixture stations and moving conveyor lines for efficient volume production of U. S. Army cargo trailers.

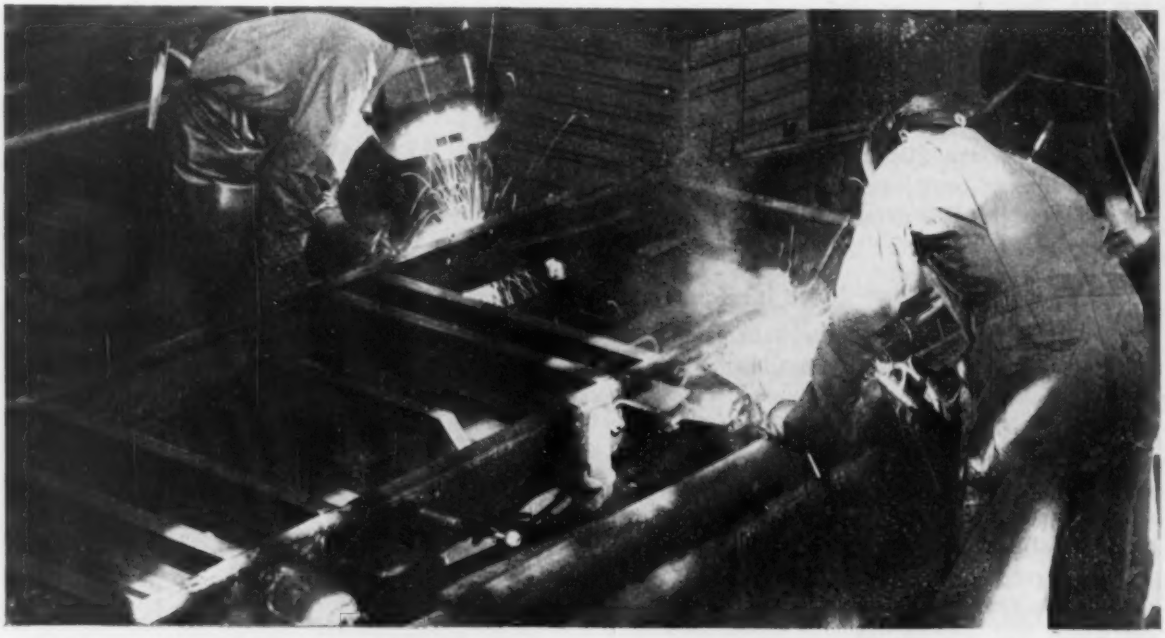
As shown in the accompanying photographs, many of the major subassembly operations on the heavy two-wheeled units produced at Checker Cab Mfg. Corp., Kalamazoo, Mich., cannot be done on conveyors which are in constant motion. Because of the manufacturing time required at certain process stages, these special handling fixtures were built to remove assemblies from conveyors, transfer them to permanent work stations and later return them to the conveyor lines.

Separate but synchronized conveyors carry chassis frames and the box-like trailer bodies through most of their individual assembly and inspection stages. Fabrication is done chiefly by hand and automatic arc welding and machine spot welding. A Webb conveyor system changes speeds to keep lines in step.

Approximately midway in the manufacturing cycle the separate lines merge as frames and body units are hooked alternately onto a single overhead chain conveyor for passage through a five-stage washer.

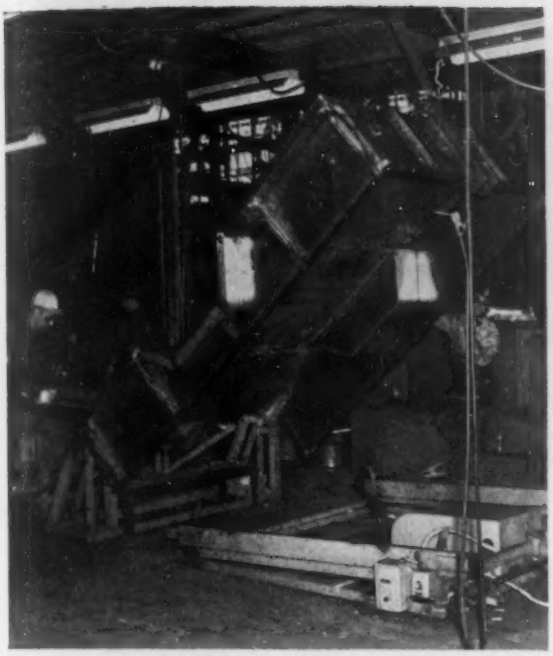
After washing, bodies and frames again move forward on separate assembly lines. Body sections progress through a paint spray booth and a drying oven while chassis units receive axle assemblies and a special paint job.

Both conveyor lines merge again for the second and last time as the painted bodies move in at a precise rate and are lowered to meet oncoming frames. After these units are fastened, wheel assembly completes the cycle.

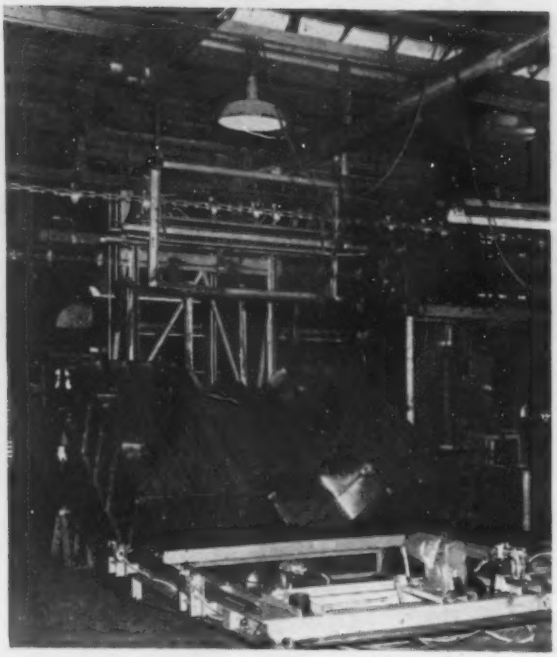


TRUNNIONED welding fixtures expedite assembly of chassis frames as hand-arc welders work from each side. Parts to be assembled are stored in adjacent locations. When completed, frames are hoisted by a hand-controlled trolley onto a conveyor loading rack.

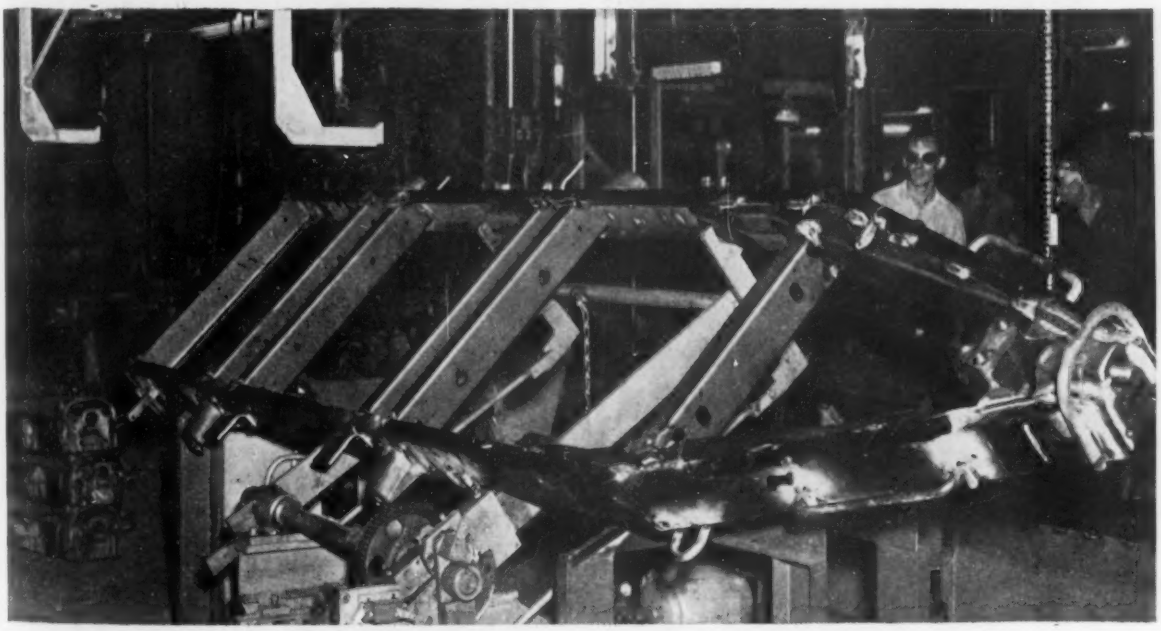
Conveyors with Permanent Work Stations



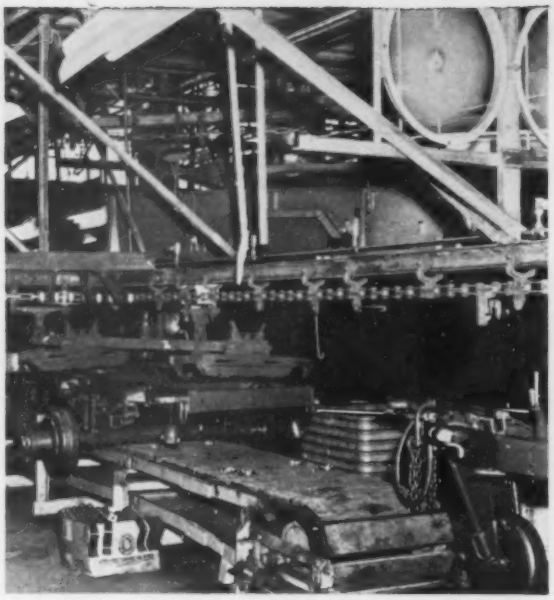
WELDED body unit is being turned bottom-up while supported by a hoist at one end. Men are grouped at conveyor (left) which receives the inverted trailer body, advances it in this position for minor hand arc welding and preliminary inspection before pre-paint wash.



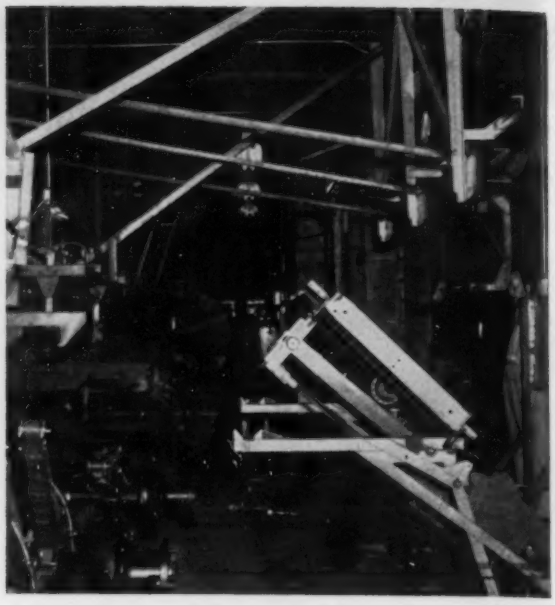
AFTER pre-wash inspection, the bottom-up body unit is hoisted onto floor roller chains. These chains move it transversely to where vertical chains can elevate the body for engagement by overhead conveyor hooks (top center). Limit switches control transfer timing.



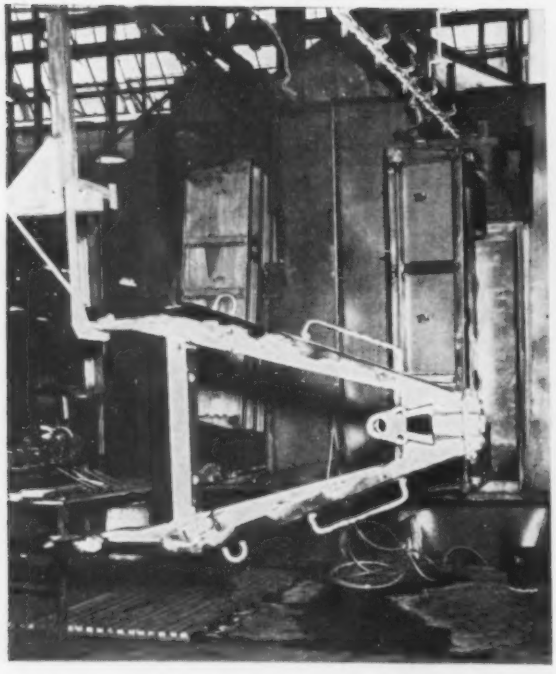
LOADING RACK is controlled by limit switches on overhead conveyor, tilts automatically as conveyor hooks come into position. Vertical frame is pushed from the rack onto the hooks. Rack tilts back for reloading as the conveyor moves frames along to a five-stage washer.



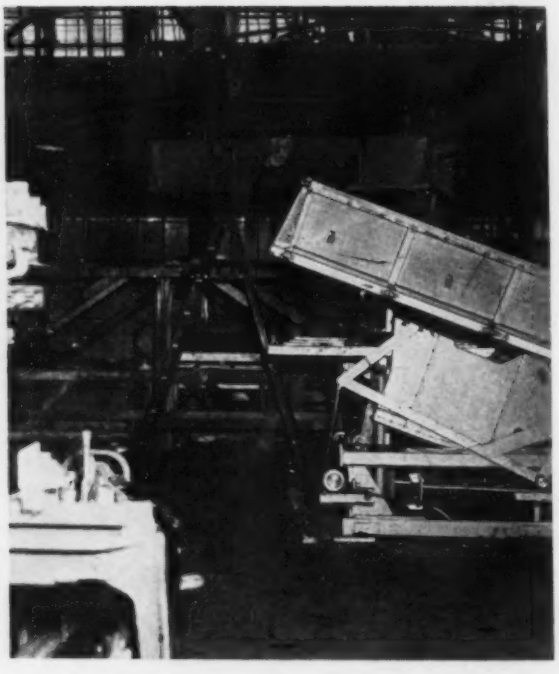
PAINTED, assembled chassis units enter this slat conveyor, move forward to meet finished bodies angling in from the right on an overhead conveyor after a painting and drying cycle. Three conveyors at this final stage call for close synchronization as bodies descend.



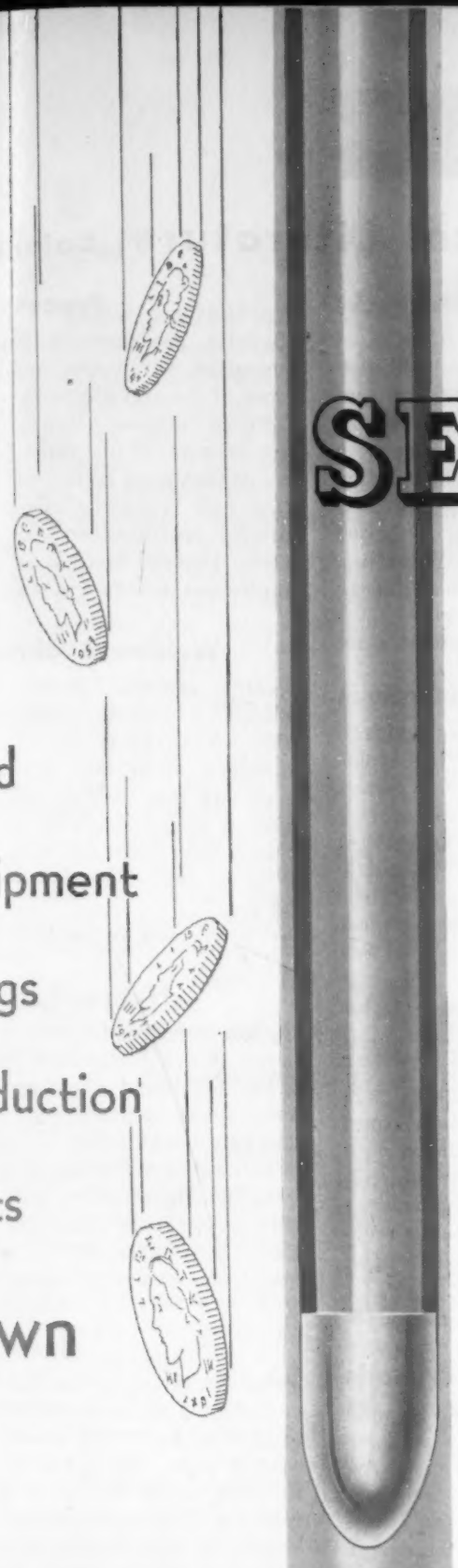
WASHED frames are lifted off conveyor hooks by the rocker-type transfer unit (right) and are lowered to a horizontal position. Floor chains (not shown) move the transfer unit and chassis to a stand (left) where an axle assembly is put on. Transfer device retracts for reload.



BODY and chassis conveyors merge to form a single line which carries alternate units in and out of this five-stage washing chamber. Front end of a frame is about to follow a trailer body (right) into the washer as a washed body unit emerges (left) and moves to a dryer.



TO ENTER paint spray booths in a horizontal position, bodies are picked off the conveyor by this transfer cradle as they emerge from the drying oven. Cradle rocks the body to a horizontal position, then automatically elevates it to meet spray booth conveyor (top).



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Technical Literature: Catalogues

Fork lift trucks

Facts on how fork lift trucks speed handling for the building industry are presented in a job study symposium released by Towmotor Corp. The trend to mass handling with fork lift trucks in this industry has mushroomed primarily because builders can reduce such on-the-job handling costs as truck unloading, storage and supplying materials to workmen. *Towmotor Corp.*

For free copy circle No. 1 on postcard, p. 143.

Solenoid valves

Bulletin covers design and performance characteristics of "DO" (diaphragm operated) solenoid valves. Folder contains photographs, line drawings, specifications and tables. The complete DO solenoid valve line, available in six pipe sizes, is illustrated. Drawings give over-all valve dimensions. *Eclipse Fuel Engineering Co.*

For free copy circle No. 2 on postcard, p. 143.

Two-pole motor

Bulletin describes Allis-Chalmers two-pole motors 900 hp and larger. Diagrams include a sectioned view of a typical large two-pole squirrel-cage induction motor, and another showing how the machine is spirally ventilated. *Allis-Chalmers Mfg. Co.*

For free copy circle No. 3 on postcard, p. 143.

Stainless steel heads

Information on press formed and spun stainless steel heads has been incorporated in a folder prepared to consolidate facts when considering the use of stainless steel heads. Reasons for selecting heads of stainless steel and a list of typical uses are included. *G. O. Carlson, Inc.*

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Process timer

Bulletin describes in detail the operation, advantages, and applications of General Electric's new type TSA-18 process timer. Included are connection diagrams for typical applications, as well as installation and "cut-away" illustrations, prices, specifications and dimensions. *General Electric Co.*

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Weldment fabrication

Folder explains Acme Welding planned weldment fabrication and the advantages of increased strength, lower cost, less machining, and less welding, offered by such a plan. Machines are illustrated with uses for each. *Acme Welding Div., United Tool & Die Corp.*

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Hydraulic grinder

Catalog describes Internal and Universal Hydraulic Grinder. Featured is the double-end wheelhead, which swings 180 degrees for internal and external grinding. Set-up time is reduced in converting to external grinding. Illustrations and specifications are also included. *Rivett Lathe & Grinder, Inc.*

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Surfactant

Petro AA, a new surfactant, is discussed in a technical bulletin. Its properties are fully described in concise form. Petro AA is soluble in most acids and over a wide range of concentrations and is also soluble in high concentrations o alkali and alkaline salts. A list o suggested applications is included *Petrochemicals Co.*

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and Bulletins

Plant protection

Booklet, "It Takes More Than Fences," reviews the most common dangers of security leading to physical losses and impairment of employee efficiency. Among subjects discussed are thefts of goods, tools and raw materials; inventory shortages and dishonest practices and collusion with competition by employees. *Wm. J. Burns International Detective Agency, Inc.*

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Die heads

Style MM Rotary H & G Insert Chaser die heads are designed for use on multiple spindle automatics or any machine where the die head rotates, such as chucking machines, bolt threaders and drill presses. Folder explains this style head which was developed to lower threading costs and to simplify the cutting of screw threads. *The Eastern Machine Screw Corp.*

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Heliwelding

Catalog describes and illustrates welding operation, manual holders either air or water-cooled, light or heavy duty water-cooled machine holders for use with the semi-automatic equipment and the automatic head that can be used with the Heliweld process. Booklet tells how each piece operates, which type of work it is best suited to, and why it is the choice for a specific job. *Air Reduction Co., Inc.*

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Drill jig bushings

Drill jig bushing catalog has been made available by the Ex-Cell-O Corp. Bushings which were previously listed as specials are now standard and carried in stock. Drill size ranges have been increased and new lengths have been added to the four groups of renewable bushings and liners. A new conversion chart has also been added. *Ex-Cell-O Corp.*

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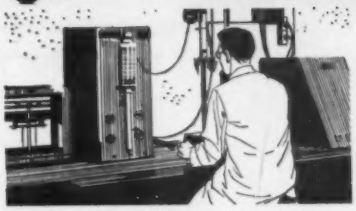
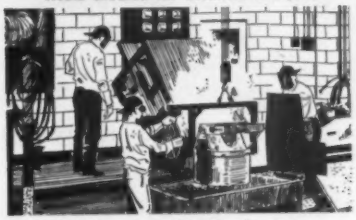
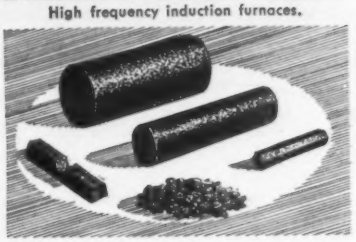


Heats checked for chemical analysis.



High frequency induction furnaces.



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FREE TECHNICAL LITERATURE

Electric fork trucks

The anatomy of electric fork trucks is closely examined, using Baker's FT-40 4000 lb capacity truck as the specimen, in a booklet put out by the company. A series of 20 pictures of the most important components of fork trucks, complete with explanatory copy, is included. *Baker-Raulang Co.*

For free copy circle No. 13 on postcard, p. 10

Publications

Catalog is a compilation of manuals, technical aids and data sheets that have been prepared by the Crucible Steel Co. of America as a result of research projects carried on at the company and other work experience. Publications listed deal with metalworking subjects including tool steels, stainless, machinery steels, agricultural steels, hollow drill steels, etc. *Crucible Steel Co. of America.*

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Thermistors

Manual enables user to understand what Thermistors are, how they are applied, what functions they perform and what benefits industry derives from them in detecting and compensating temperatures and providing time delay or surge control in electrical equipment. Booklet covers applications, characteristics of the Thermistor material, explanations and general information. *Carboloy Dept., General Electric Co.*

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Input controller

Truetemp Input Controller is an instrument which is added to any existing "on-off" temperature control system that is thermocouple actuated, to provide furnace or heating temperature control as close as 0.2 degrees Fahrenheit. Bulletin details the theory of Truetemp's operation, explaining how deviations from the desired heating temperature can occur with present industrial temperature control systems. Specifications are included. *The Winslow Co.*

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Turn Page

Sensational NEW AUTOMATIC SPRAY DECORATING MACHINE

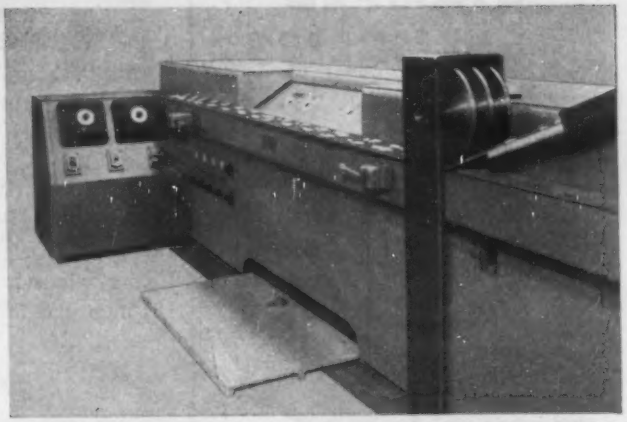
with no interruption of continuous painting production, automatically washes masks right in the machine and returns them to painting position clean and dry.

No other machine ever required so few masks—two per color. Permits tremendous savings in mask investment.

Simultaneously paints two colors on one part or one color on two parts.

Capacity of up to 3,600 pieces per hour, depending upon handling facilities and decoration applied.

Fully adjustable as to amount of paint applied, number of coats and speed of operation. Clean, filtered air is induced for exhausting purposes, and foreign matter is kept from the spray area.



Installation for large toy manufacturer. Work flows continuously and directly from the molding machine to the painting operation, and thence by conveyor to assembly.

ENORMOUS SAVINGS IN COLOR DECORATION OF 3-DIMENSIONAL PARTS

ELECTRO-FORMED METAL SPRAY PAINTING MASKS

(Made by Patented Process)

Permit rapid wet painting, one color after another. Clean, sharply defined letters and decorative effects obtained on intricate die castings, stampings and plastic forms by accurate control of painted areas. No fogged edges. After-wiping or buffing-off of over-spray unnecessary. The "loose" inside of letters and numerals, such as "O" and "6" is held in position by arched bridging to eliminate objectionable "ties". Plug-type masks (keep depressed areas clear, while spraying background); lip-type masks (protect background while painting depressed areas); and block-cutout, plane-surface type masks.

CONFORMING MATRIX CORPORATION

350 Toledo Factories Bldg., Toledo 2, Ohio.

Please send without obligation, details on
☐ Hand Masks; ☐ Mechanical Masking Fixtures;
☐ Automatic, Spray-Painting Masking Machine;
☐ Mask-Washing Equipment; ☐ Quotations on masks for parts (or prints) which I am forwarding.

Name .....

Firm .....

Street .....

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ON THE WEST COAST:
38 LaPorte St., Arcadia, California

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Send samples or prints for quotations on special stampings and sub-assemblies. Write for bulletin and prices on standard and special case hardware.

J. H. SESSIONS & SON

290 RIVERSIDE AVENUE • BRISTOL, CONN.

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Turn to pages 2 and 3 of The Iron Age every week and let the

Digest of the Week in Metalworking

help you find your favorite features.

IT PAYS TO READ IRON AGE ADS TOO!

Handling:

Mechanized methods save time and storage space.

A 75 pct reduction in operating time and storage space requirements through mechanized materials handling was made possible recently at General Metal Products, St. Louis, through use of improved handling methods.

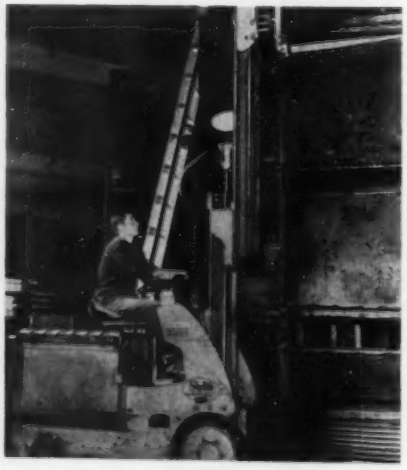
The streamlining has resulted in better utilization of manpower. Using electric industrial trucks, six men can do the work formerly done by 24.

Less Storage Needed

Fork lift trucks have enabled the company to condense parts-in-progress storage to one-fourth the floor space previously needed when parts were stored on the floor level only.

The firm has a three-phase materials handling system in its production of stampings, fabrications, and dies. Each phase of the system is based on the operation of types of electric trucks which carry materials to a variety of processing machines used in the plant which covers a 6-acre area.

Cuts die setting time . . .



Improves space use . . .

Shop Box Handling

GMP uses a Skylift fork truck to transport steel shop boxes containing metal parts in various stages of fabrication. The truck handles these loads, weighing from 3000 to 4000 lb, in two operations: to transfer parts from department to department; or for stacking in a storage area at one corner of the plant.

Time involved in transporting and stacking the boxes with the Skylift fork truck was also cut drastically—completing in 15 minutes the work which required a full hour under the hand-truck method, according to a company time study.

Die Handling

By substituting an electric-powered Automatic truck for a two-wheel hand truck, similar time savings have been realized in servicing dies to presses.

Forming dies are carried on the truck's forks from die storage racks to presses, as the die setters call for them. Weight of the dies range up to 6000 lb, the rated capacity of the truck. Yet dies are swiftly and easily placed into the presses.

Small Parts Handling

Production of fabrications and assemblies constitutes a major portion of GMP's operation. With small parts in particular, volume

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 143. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

processing requires top efficiency all along the line.

To speed production in this department, the firm employs a special Automatic Transportation Co. fork lift truck, equipped with a "roll-over" or revolving clamp attachment.

Twenty Transfers Per Hour

Barrels of small parts are transferred to a parts feeding hopper in position for the next manufacturing operation, raised and dumped by the truck. Up to 20 such transfers can be accomplished per hour by one truck operator.

Although the primary purpose of this Automatic fork truck equipped with revolving clamp is to supply small parts to feeding hoppers, it is also used to transfer parts from processing containers into shipping containers.

At other times the unit is used to transfer refuse or scrap to the scrap pit, and it has been used in maintenance work in setting motors and other equipment.

Automation:

Combination drill, broach and stamping unit developed.

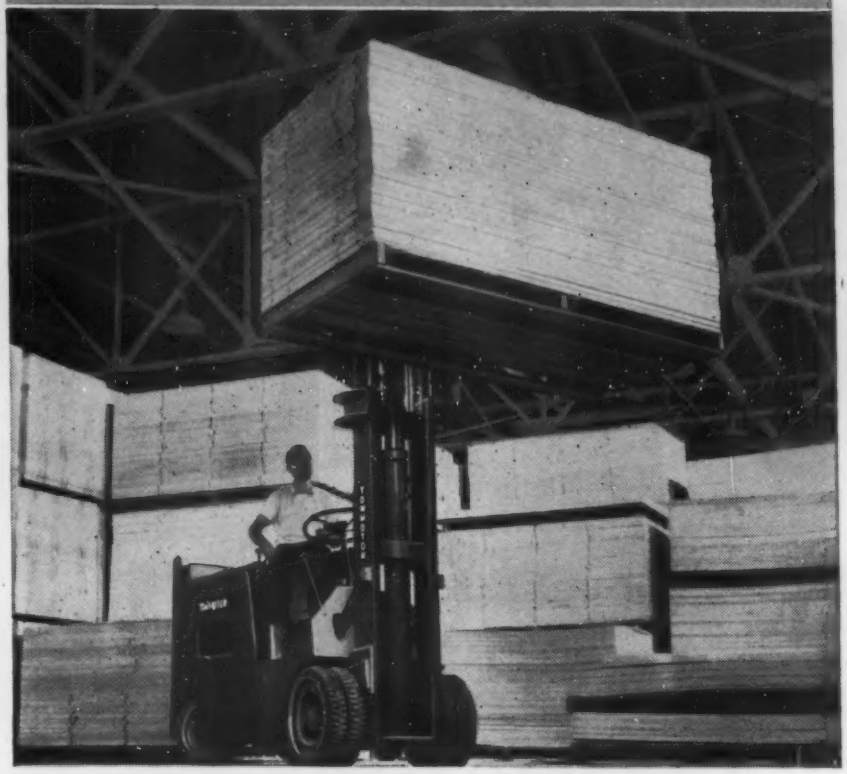
Following the trend to automation, an automated 3-station machine to include a drill unit, a broaching machine, and a stamping unit has been developed. All individual operations are performed on a common base in one continuous cycle.

All three individual machining operations are grouped around the "heart" of the automated machine—the loading and indexing mechanisms, according to Colonial Broach Co., Detroit. A typical machining cycle on an automotive camshaft sprocket includes in the following order: (1) Drilling one 0.2656-in. diam hole in the web of the sprocket, (2) Broaching a 0.1885-0.1905-in. keyway in the shaft hole, and (3) Stamping the timing mark on the sprocket.

Guides Play Important Role

Included in the loading and indexing fixtures are locating guides that maintain all three operations

LEASE-A-TOWMOTOR



Get Lower Handling Costs ... without capital investment!

In addition to regular terms, you can also get prompt delivery of new Towmotor equipment without a cash outlay.

"Lease-A-Towmotor" Plan

The "Lease-A-Towmotor" Plan requires no capital investment and only a small monthly rental payment. Towmotor users report savings of up to 60% over old handling methods. Advantages include—

(a) Greater handling efficiency in your receiving, storage, production and shipping operations without capital investment. You pay low monthly rental during lease contract period. No down payment is required.

(b) Greater handling economies with modern Towmotor equipment. Your business will enjoy the competitive advantages of lower costs.

You have a choice of a 3 or 5-year lease. Monthly payments are graduated downward over the 3-year period and are proportionately lower over the 5-year period.

TOWMOTOR Time Payment Plan. You can also buy your Towmotor material handling equipment spreading the cost over 6 to 36 months. No outside financing necessary. Towmotor handles complete arrangements. Minimum down payment.

Mail the coupon and let Towmotor solve your material handling problems.

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THE ONE-MAN-GANG

FORK LIFT TRUCKS and TRACTORS
SINCE 1919

TOWMOTOR CORPORATION, Div. 1508, 1226 E. 152nd St., Cleveland 10, Ohio

Please send me more information on:

- ☐ "Lease-A-Towmotor" Plan
- ☐ Towmotor Time Payment Plan
- ☐ Have a Towmotor Mass Handling Engineer call

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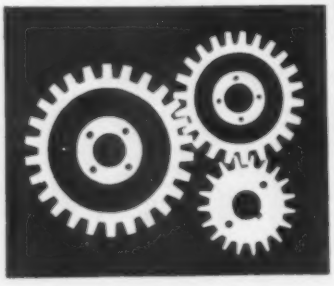
From huge aircraft engines to tiny precision instruments—there's no end to the variety of products improved by Perkins custom-cut Gears!

Perkins is a *gear engineering* organization with a 35 years' tradition of New England craftsmanship as background. As one of the country's largest producers of gears to customers specifications, Perkins will meet your specific requirements for gears—regardless of size, type, material or quantity desired, *and at competitive prices*. You furnish the specifications, we'll produce the gears.

PERKINS MAKES in all materials, metallic or non-metallic, and in any size, to your specifications: helical gears, bevel gears, sprockets, ratchets, worm gears, spur gears with shaved or ground teeth, ground thread worms.

NOTE: The **PERKINS PRECISION SPRING COILER** is the latest development in the spring coiler field and eliminates entirely the use of arbors and long set-up time. It is a complete self-sufficient machine and enables you to make the spring you want *when* you want it — in seconds. The coiler produces any type of spring, in any diameter and any pitch with this range: Wire Sizes .005" to .125. Diameter from 3/32" to 12" and larger. Size of the compact coiler is only 7½ x 16". **A POWER MODEL** mounted on a welded steel console cabinet base is also available. Full information on request.



Perkins Machine & Gear Company
WEST SPRINGFIELD, MASS.

Loading and indexing mechanism heart of unit... Special chucks used

in proper relationship to one another. Broaching is accomplished by a Colonial RD-624, pull-down broaching machine. A special hydraulically actuated unloader deposits the completed parts onto a conveyor.

The key to this particular unit is the table loading and indexing mechanism. The indexing table is located off-center and below the loading table. Parts such as sprockets are loaded six at a time into circular holders on the ends of oscillating loading arm.

Drop One At A Time

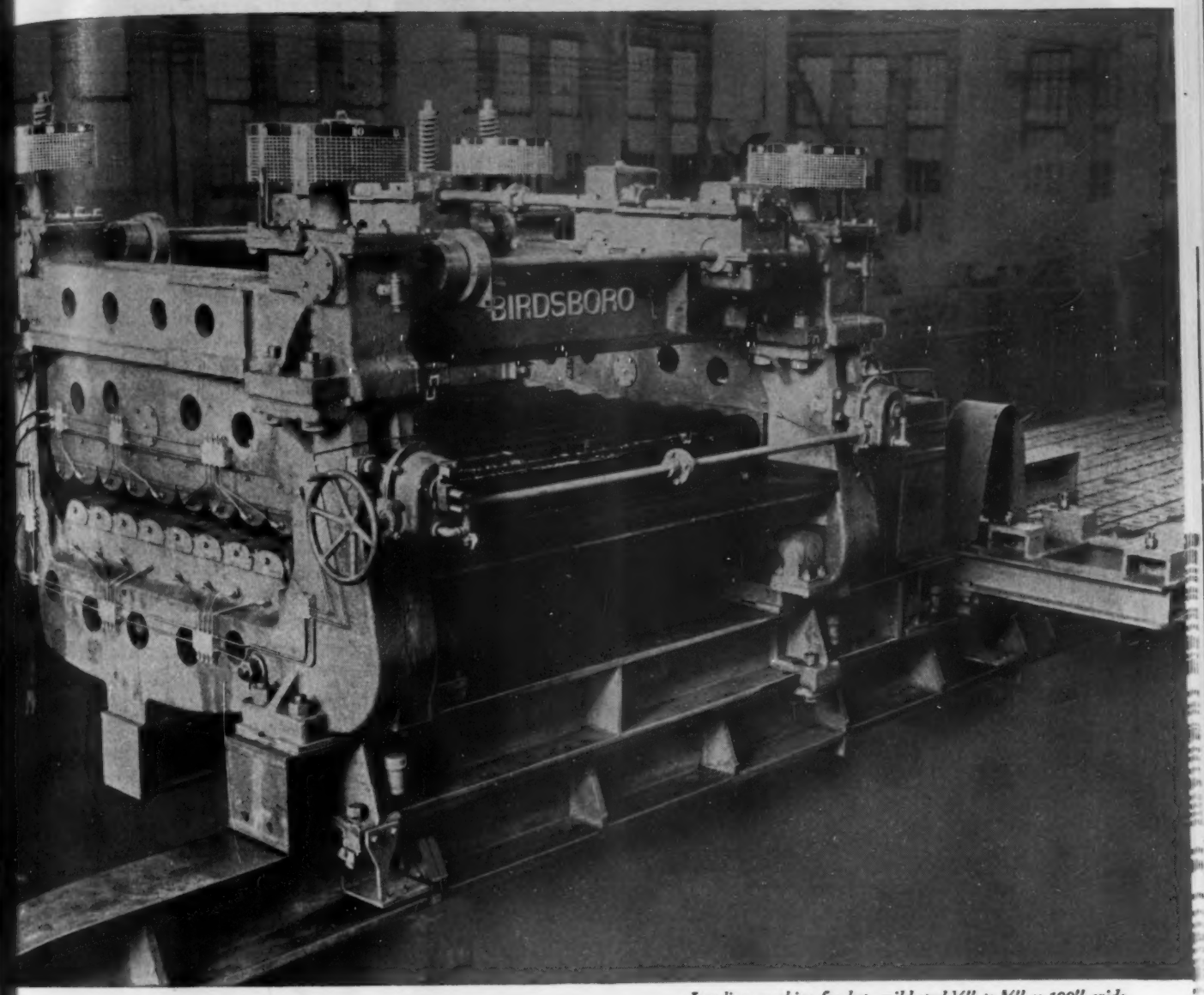
Each holder contains an escapement mechanism allowing the sprockets, to drop, one at a time, onto the indexing table. When the sixth sprocket drops, it triggers a switch that swings the arm around to a position where the empty holder is reloaded and the holder on the opposite end begins discharging parts into the chucks on the index table.

The rotating index table is hydraulically actuated. It contains around the periphery four equally spaced special chucks that receive and locate parts from the loading mechanism. A hole in the indexing table between adjacent chucks allows the broaching tool to be returned following its working stroke. This means that the table is indexed every 45°.

Production: 200 Per Hour

Using the typical application again, the Colonial-designed machine performs the three machining operations on the sprockets, plus loading and unloading, on over 200 parts per hour. One 10-hp motor supplies the hydraulic power for loading, indexing, broaching, stamping and unloading. All electrical and hydraulic circuits are designed according to J. I. C. Standards and are carefully interlocked for safety reasons.

Keeps leveling costs *on the level*...



Leveling machine for hot, mild steel ¼" to ⅜" x 100" wide.

BIRDSBORO Plate Leveler

Designers and Builders of:
STEEL MILL MACHINERY
HYDRAULIC PRESSES
CRUSHING MACHINERY
SPECIAL MACHINERY
STEEL CASTINGS
Weldments "CAST-WELD" Design
ROLLS: Steel, Alloy Iron, Alloy Steel

If you think that high costs are a "necessary evil" on your leveling jobs, investigate the cost-saving advantages of smooth running, maintenance-free BIRDSBORO precision levelers.

There's a BIRDSBORO Leveling Machine designed to give you maximum results at minimum cost, whether your operations include leveling of hot or cold, heavy or light plate. BIRDSBORO engineers also have the diversified experience and know-how to design, engineer and build special levelers to meet your specific requirements.

Put BIRDSBORO engineers to work on your application . . . and keep leveling costs "on the level".

MM-31-54

BIRDSBORO

BIRDSBORO STEEL FOUNDRY & MACHINE CO., BIRDSBORO, PENNA. Offices in Birdsboro, Pa. and Pittsburgh, Pa.

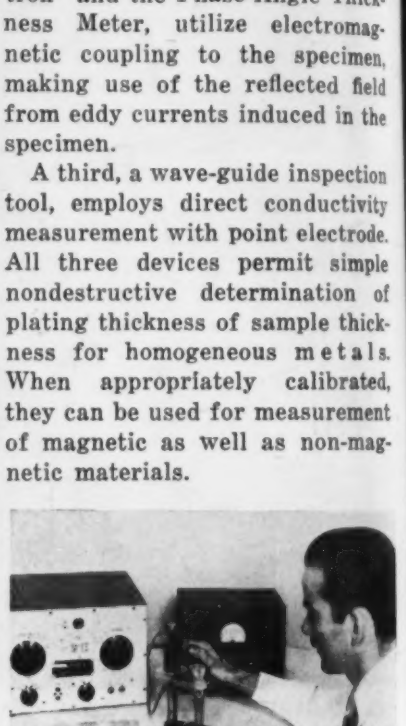
Gaging:

Electronic devices gage metal coating thickness.

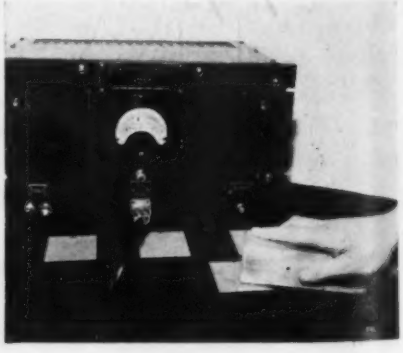
Three types of instruments for measuring the thickness of electrodeposited coatings have recently been developed by the National Bureau of Standards. While all three instruments depend upon the difference in electrical conductivity between the plating and the basis metal, each makes use of different methods for sensing specimen resistance.

Two instruments, the "Dermitron" and the Phase-Angle Thickness Meter, utilize electromagnetic coupling to the specimen, making use of the reflected field from eddy currents induced in the specimen.

A third, a wave-guide inspection tool, employs direct conductivity measurement with point electrode. All three devices permit simple nondestructive determination of plating thickness of sample thickness for homogeneous metals. When appropriately calibrated, they can be used for measurement of magnetic as well as non-magnetic materials.



Plating thickness is . . .



. . . measured with . . .

The Dermitron senses the reflected flux in a single coil which is excited with high frequency current when it is in close proximity to the specimen. The probe coil is very small and designed to be held in physical contact with the sample. Its miniature size makes it possible to measure plating thicknesses of small specimens and sharply-curved surfaces.

Portable and Direct Reading

When the instrument is calibrated for the specific use, measurements can be made on combinations of metals regardless of whether either coating or basis metal is magnetic or nonmagnetic. The instrument is portable and direct reading and should provide a convenient means for routine testing of a manufacturer's output.

The Phase-Angle Thickness Meter relies on the measurement of reflected electromagnetic field with a separate pickup coil. For this it requires a somewhat more complicated electronic circuit. Through a bucking transformer arrangement a voltage is derived whose phase shift is a direct function of the specimen conductivity. Measurement of phase change thus provides a means to indicate plating thickness.

Continuous Measurement

Originally developed for the rapid, continuous measurement of the thickness of silver plating on such large areas as stainless steel wave guides, it offers insensitivity to variation in probe-to-sample spacing. With suitable calibration,

. . . these new instruments.

for

DIFFICULT-TO-LUBRICATE PLACES

SEALED-IN CONSTRUCTION

INTERMITTENT SERVICE

SELF-ALIGNMENT

LIGHT DUTY

POWDER METALLURGY made possible this versatile bearing . . . molded pre-cast bronze alloy powder impregnated with oil for self-lubrication. Myriads of tiny, evenly spaced pores serve as miniature oil wells. When the bearing is in use the oil is metered to the shaft . . . when at rest, the oil is reabsorbed by the bearing. These Ledaloyl bearings are widely used for small motors and fans, and have wide acceptance for self-aligning applications. Their extremely low cost, (no machining necessary), makes them practical for use in many types of equipment where heavy duty is not a factor. A wide selection of plain, single flanged, double flanged and self-aligning Ledaloyl bearings is available from distributors' stocks, while special sizes and styles of bearings and parts can be made to order. Write for complete information.

JOHNSON BRONZE CO., 505 South Mill St., New Castle, Pa.

JOHNSON B BEARINGS
Sleeve-Type

OTHER BEARING TYPES:
General Purpose (GP) • Electric Motor (EM) •
Graphited • Universal Bronze Bars • Babbitt

the instrument can also be used on magnetic materials, but probe-to-sample spacing must be controlled.

Checks Voltage Drop

The Waveguide Plating Quantity Indicator was developed to permit measurement on both nonmagnetic and magnetic materials without change of calibration. The specific application was for use on waveguides having an intermediate layer of nickel of unknown thickness between the silver and stainless steel.

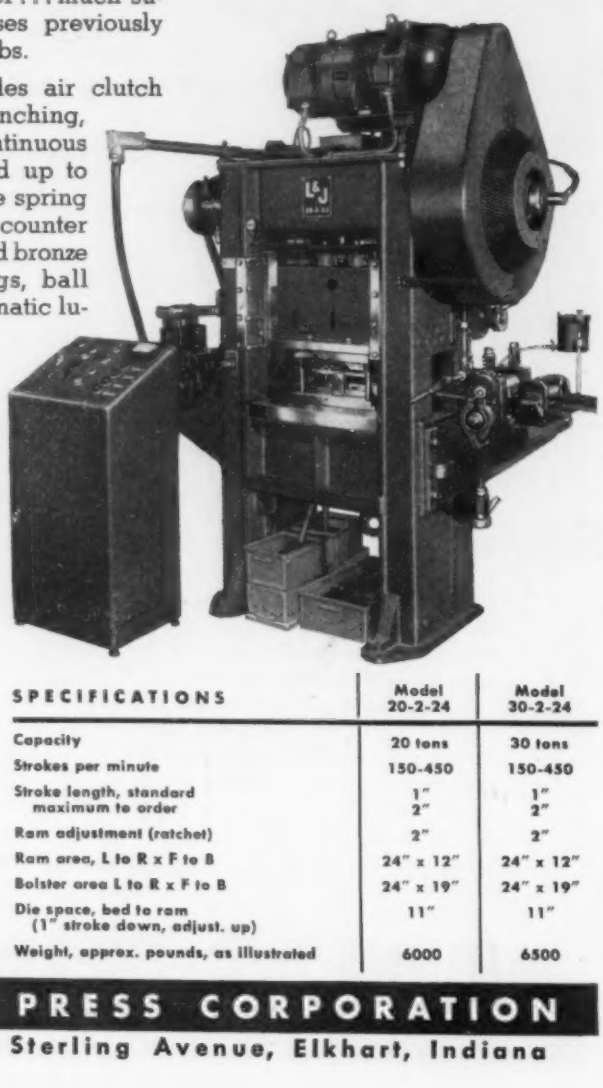
In the instrument a d-c current is passed through the specimen, and the voltage drop across a known distance is measured. While the silver plating is on the inside of the waveguide, its effect on the d-c conductivity measurement is the same as for outside plating. Thus the probe electrodes can be arranged to make contact on the outer surface, simplifying the measurement procedure.

L&J DOUBLE CRANK PRESSES
for High Speed Production

These versatile double crank, straight side punch presses can multiply your production of small precision parts. Proven by users to be more efficient, accurate, economical of manpower . . . much superior to any presses previously used for the same jobs.

Equipment includes air clutch with controls for inching, single stroke and continuous running—any speed up to 450 SPM; air release spring set brake; two air counter balances on ram; hard bronze crankshaft bushings, ball seats and gibs; automatic lubrication; feeding device and other equipment to meet the most exacting requirements.

Write for complete information. Also 6 to 80 ton O. B. I. Presses.



Advantages

Faster production
Precision parts
Large die area
Long die life
Adaptable for many jobs
Low operating cost

Features

High speed with accuracy
Box type ram
Adjustable square type hard bronze gibs
Box type, rigid, welded steel frame
Auxiliary equipment to suit the job

SPECIFICATIONS	Model 20-2-24	Model 30-2-24
Capacity	20 tons	30 tons
Strokes per minute	150-450	150-450
Stroke length, standard maximum to order	1" 2"	1" 2"
Ram adjustment (ratchet)	2"	2"
Ram area, L to R x F to B	24" x 12"	24" x 12"
Bolster area L to R x F to B	24" x 19"	24" x 19"
Die space, bed to ram (1" stroke down, adjust. up)	11"	11"
Weight, approx. pounds, as illustrated	6000	6500

L&J PRESS CORPORATION
1623 Sterling Avenue, Elkhart, Indiana

New Books:

Fair day's pay for fair day's work discussed in book.

"Job Evaluation Methods," second edition, by C. W. Lytle, M. E. Book contains reference to all currently accepted methods and techniques for determining a fair day's pay for a fair day's work. It shows how to build up a job evaluation plan for necessary elements; how to meet the requirements of an individual company. Every phase of job evalution is explained with a step-by-step analysis. Discusses incentive methods, rate structures. The Ronald Press Co., 15 East 26th St., New York 10. $7.50. 507 p.

"Guide for Safety in the Chemical Laboratory," prepared by the General Safety Committee of the Manufacturing Chemists' Assn., Inc. Recommended safety procedures are set forth in detail including handling of chemicals, protective equipment and devices, contamination control and specific first aid instructions. Also covered are the latest protective measures for the safe handling and use of radioactive materials. D. Van Nostrand Co., Inc., 250 Fourth Ave., New York. $4.25. 234 p.

"Residual Stresses in Metals and Metal Construction," edited by W. R. Osgood. Describes and evaluates the effects of residual stresses upon the performances of various kinds of structures. Emphasis is placed on the possible contributions of these stresses to fracture. A summary covers many aspects of the residual stress problem. Reinhold Publishing Corp., 330 West 42nd St., New York 36. $10.00. 363 p.

"Monomolecular Layers," edited by Harry Sobotka. Aim is to give a cross section of recent progress in monomolecular layers. A symposium presented at the Philadelphia meeting of the American Association for the Advancement of Science. American Association for the Advancement of Science, 1515 Massachusetts Ave., N.W., Washington 5, D. C. $4.25. 207 p.

"Fehlererscheinungen An Guss-Stucken," by E. Knipp. Reviewed by W. Trinks, Professor Emeritus, Carnegie Institute of Technology. Deals with pipes, cavities, blowholes, nonmetallic inclusions, sand filled depressions, burnt-in sand, incomplete filling of mold, segregations, cracks and warping.

Causes of these defects and the means for their prevention are discussed in detail for cast iron, malleable castings, steel castings, heavy nonferrous metals, and for light metals. The book presents a comprehensive treatise on the subject. Giesserei Verlag, Dusseldorf, Germany. $6.25. 261 p.

'Principles of Experimental Stress Analysis," by M. B. Moore. Book details uses and the limitations of experimental stress analysis. Strong emphasis is placed on the prevention of failure of engineering structures and machines by proper experimental stress analysis and the use of mathematics is kept to a minimum. Aims to stimulate original thinking and laboratory experiments are coordinated with the theoretical work presented. Prentice-Hall, Inc., 70 Fifth Ave., New York 11. $4.00. 146 p.

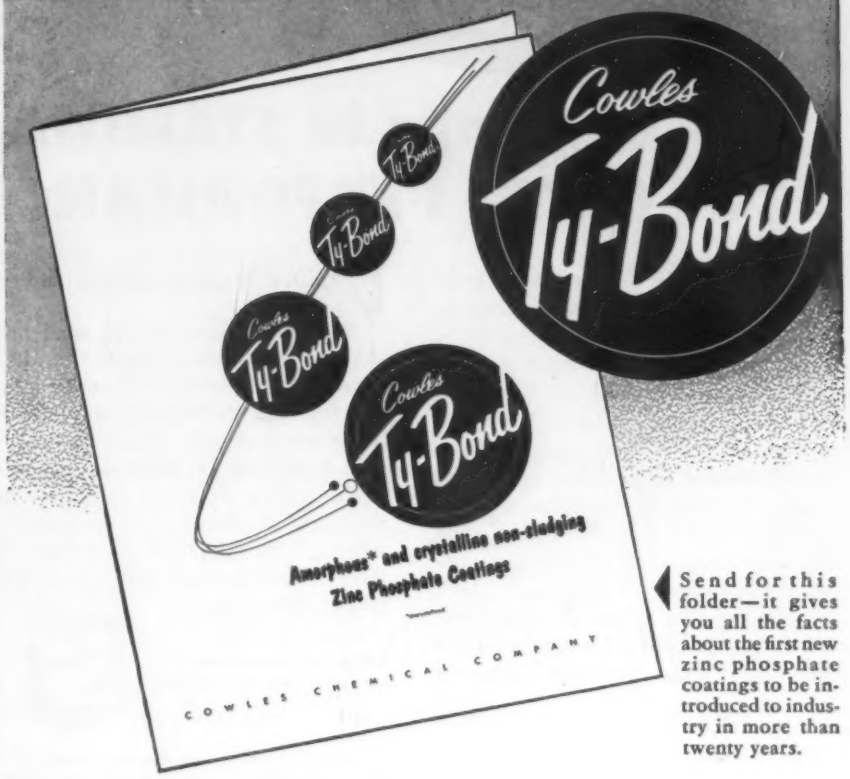
"Quality Control," second edition, by N. L. Enrick. Written to be practical and usable, emphasis is on clarity of directions and simplicity of methods of quality control procedure. Highlights of the book are sections on readymade sampling plans, sample control charts, compressed limit gages, basis of proper specifications, separate theoretical chapters and a chapter dealing with problems arising when equipment is old. The Industrial Press, 148 Lafayette St., New York 13. $4.00. 181 p.

"ASME Handbook," edited by Samuel Hoyt. Book compiles specific information for designers about the properties of metals such as strength, hardness, machinability, electrical conductivity, etc. Using charts and tables, this book brings data on more than 500 metals in common industrial use. Book is sponsored by The Metals Engineering Handbook Board of the American Society of Mechanical Engineers. McGraw-Hill Book Co., Inc., 330 West 42nd St., New York 36. $11.00. 433 p.

"Handling Equipment Manual," second edition. Here in one convenient volume is included a Master Chart of Materials Handling System, an Equipment Application Guide, an Equipment Selection Guide, and Industrial Truck Specifications for 1954 and 1955.

The handbook was designed for use in planning installation of new handling systems, additions to old systems, and for analyses of present systems. Setup on basic operational function, the handbook can be used by both the experienced materials handling engineer, or by production, traffic, management and others concerned with movement of materials. Prepared by the editors of *Distribution Age*. The Chilton Co., Chestnut and 56th Sts., Philadelphia 39. $1.50.

COWLES INTRODUCES
NEW
ZINC PHOSPHATE COATINGS



Send for this folder—it gives you all the facts about the first new zinc phosphate coatings to be introduced to industry in more than twenty years.

Your Cowles Technical Man will gladly give you complete technical information about Cowles Ty-Bond coatings and also the complete line of industrial metal cleaners.

COWLES CHEMICAL CO.
7016 Euclid Ave., Cleveland 3, Ohio

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☐ Arrange to have your Cowles Technical Man see me about _____ (DATE)

Name _____ Title _____
Company _____
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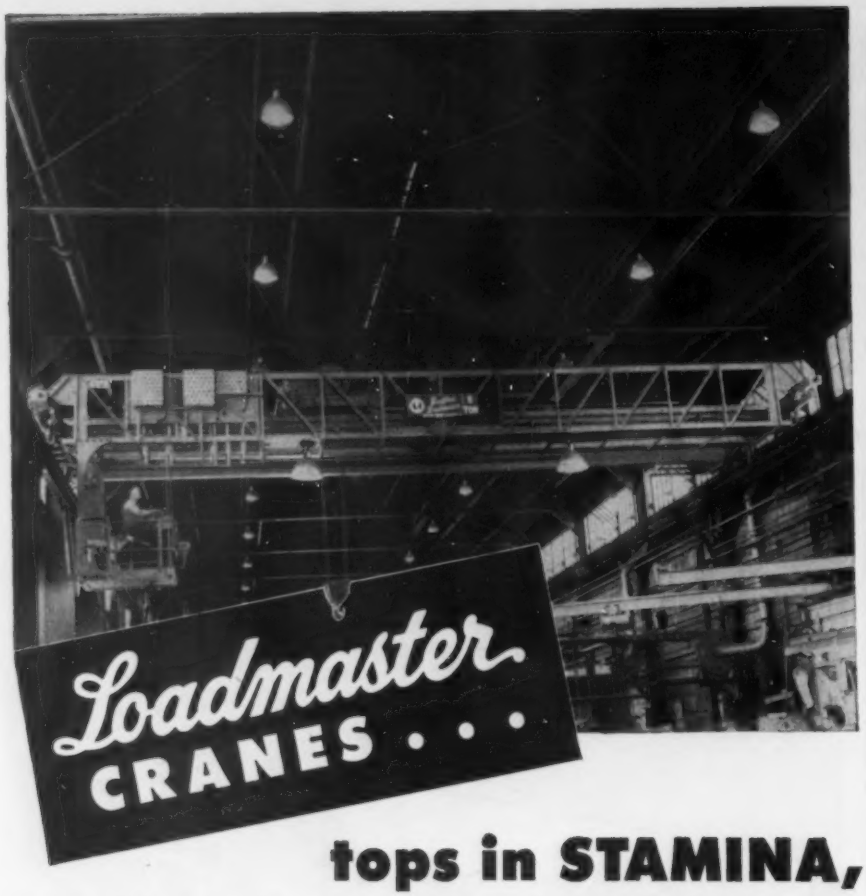

tops in STAMINA, ECONOMY, PERFORMANCE

LOADMASTER Cranes make good on every installation—that is proven not only by enthusiastic comment from owners, but by a high percentage of repeat orders.

Take Tool Steel Gear & Pinion Company of Cincinnati, Ohio—world-famous heat treat specialists and precision machinists. In the spring of 1952 three industrial type Bedford overhead cranes were installed in their new Plant No. 2, north of Sharonville, Ohio. A year later when they needed a new crane in the heat treat room at their Elmwood plant, they installed their fourth Bedford crane.

Bedford industrial and steel mill cranes are backed by more than half a century of specialized crane engineering and fabricating experience. They are available in all types and sizes from 5-ton to 350-ton capacities.

Consult a Bedford engineer on your next overhead crane problem . . . with all the facts on the table, we believe you too will make your next crane a Bedford.

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New York Office: 280 Madison Avenue
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ENGINEERED CRANES

BEDFORD

BEDFORD FOUNDRY & MACHINE COMPANY, INC. · BEDFORD, INDIANA

New Films:

Industry tells its story with slide and motion films.

"Precision Casting"—Three-dimension slide film series, approximately 45 slides, in color, shows precision investment castings by the frozen mercury process. Alloy Precision Castings Co., East 45th and Hamilton Sts., Cleveland 14, Ohio.

"The Story of Bolts, Nuts, and Allied Steel Fasteners." This 16mm sound-color film covers the entire manufacturing process from beginning to end in 26 minutes—basic steelmaking in open hearth and electric furnaces, rolling of bars and rods, pickling and cleaning, automatic bolt making machines and nut formers in operation, laboratory testing, packaging and warehousing. Bethlehem Steel Co., Bethlehem, Pa.

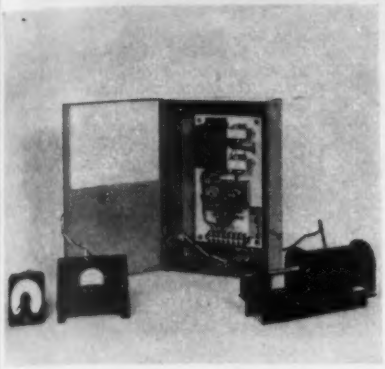
"Powered Industrial Trucks" is a 25 minute film in black and white with narration. It is a composite of the most valuable sequences from more than 20 films submitted by 10 member companies of The Material Handling Institute. Harry W. Smith, Inc., 41 East 42nd St., New York 17, N. Y.

"Powered Industrial Trucks," is a 16 mm film (1000 ft) with sound narration in black and white. Film is designed to acquaint the engineering or commerce student with the development, types and uses of the fork-lift and other types of powered industrial trucks. Film is available for sale or on a nominal rental fee. College-Industry Committee on Material Handling Education, 8444 So. Yates Ave., Chicago 17, Ill.

"Package for Profit," is an 11-minute sound movie which shows stapling machines operating in actual installations and explains their operation. Operators demonstrate six representative stapling machines from a complete line. Prints of the movie are available for loan on a no-charge basis. International Staple and Machine Co., 801 East Herrin St., Herrin, Ill.

NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies . . . for more data use the free postcard on page 143 or 144



Device returns linear motion machines to prior position

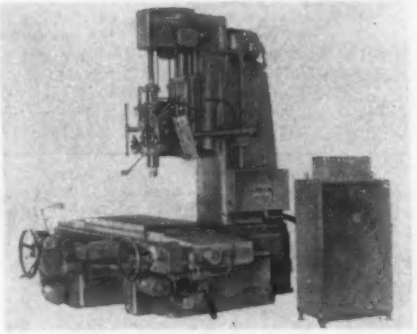
With a new electrical device an operator of a linear-motion machine can return the machine to a previous position within 1 pct accuracy. Called an Electric Position Transmitter for Linear Motion, the unit was developed for use on a roller leveler in the steel industry. It can be applied wherever linear-action machines must be returned to prior operation positions with accuracy. Components of the unit are a transmitter on the machine, a control panel at any convenient place, and an instrument located at the operator's control station. Positions of the machine are measured and transmitted exactly to the operator. The unit will transmit total travel in ranges from ⅝ to 3 in. *Control Products Co., Inc.*

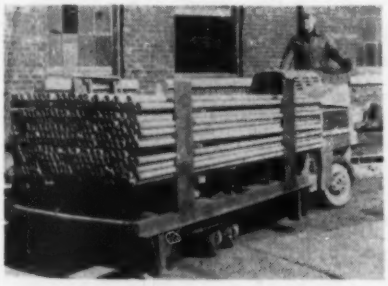
For more data circle No. 31 on postcard, p. 143.

New jig borer added to P&W Electrolimit line

A 13-ton machine for precision locating, boring, milling and checking is the latest of the Electrolimit Series. Ample working space is provided by the 28x56 in. table; travel is 48 in. longitudinally and 28 in. transversely. Two separate Electrolimit measuring units are employed for these movements. Maximum height between table and spindle end is 30 in. Columns 6, 10 or 14 in. higher than standard can be furnished, increasing the machine capacity accordingly. The jig borer has electronically controlled milling feeds infinitely variable from 1 to 15 ipm. Rapid power travel of 60 ipm is also provided. *Pratt & Whitney.*

For more data circle No. 32 on postcard, p. 143.





Long platform truck easily handles unique rack

A low-lift platform truck has been engineered to handle an extra-long rack that serves as a storage unit, load carrier, and work positioner. The truck has a 108 in. long platform and a capacity of 10,000 lb. It is gasoline-powered. The rack is used for yard storage of pipe. In operation the truck easily picks up the rack and transports it to work stations inside the plant where it provides a handywork positioner. This platform handles 10-ft long loads. *Elwell-Parker Electric Co.*

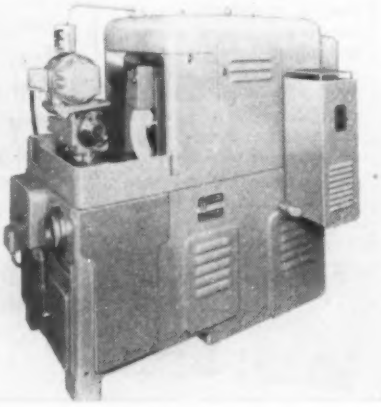
For more data circle No. 33 on postcard, p. 143.

Accessibility, simple setups feature new form grinder

Compact design of an accurate, high production plunge form grinder affords exceptional accessibility and simple setups. The machine is 44x78¼ in. Its versatility permits use for chucking work, center work or shoe type grinding; crush wheel or diamond trueing; with automatic or manual handling. A completely automatic cycle — high speed approach, wheel feed, sparkout and withdrawal — is controlled through simple cam action, insuring constant, uniform operation under all conditions. The wheel slide is held against a positive stop with uniform hydraulic pressure for automatic, positive size control. Maximum diameter of swing over table is 13 in.; length between centers, 7½ in. or up to 32 in. *Jones & Lamson Machine Co.*

For more data circle No. 34 on postcard, p. 143.

Turn Page



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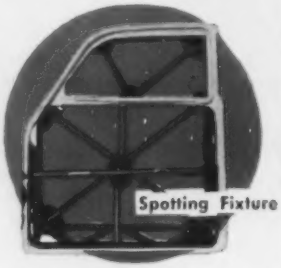

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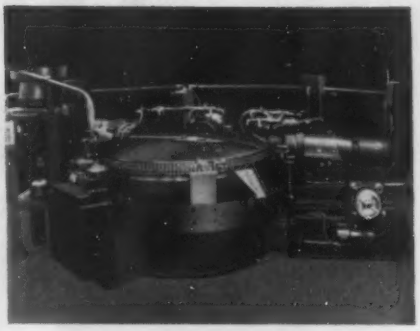
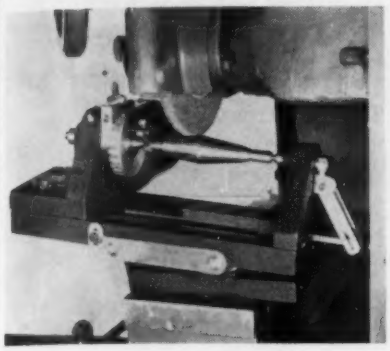
Grinds spherical radius on heads of valve tappets



Progressive finishing spherical radius on heads of automotive valve tappets is accomplished on a specially designed automatic grinder. The radius is produced exactly according to the radius of the table with the 0.015 in. of metal removal provided by four grinding spindles mounted at right angles to the fixture. The table containing 160 individual fixtures rotates continually at 140 ipm, passing the tappets in the fixtures across the face of the rotating grinding wheels. Production is 4000 pieces per hr at 100 pct efficiency. *Motch & Merryweather Machinery Co.*

For more data circle No. 35 on postcard, p. 143.

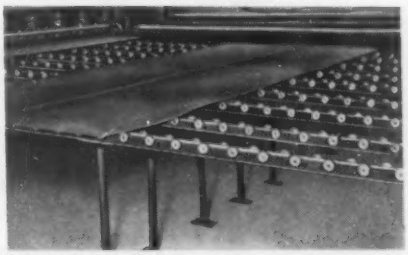


Attachment performs cylindrical and index grinding

Within its size limits Cylindex, a practical surface grinder attachment, is said to do the work of a more costly cylindrical grinder, at nearly the same production rate. It will grind tapers and flats with high accuracy. Cylindex fits all makes of surface grinders and is easily handled, quickly set up. This solidly built attachment does away with makeshift rigs. It provides sustained accuracy—work held on dead centers; permits wet or dry grinding. Maximum length between centers is 7¼ in.; swing 6 in.; chucking diameter, 2 in. Index plate has 24 positive divisions. Spindle speed is 170 rpm. *Binghamton Die & Machine, Inc.*

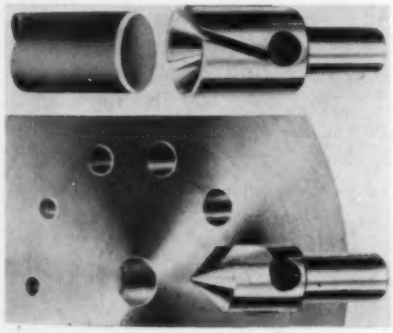
For more data circle No. 36 on postcard, p. 143.

Wheel-type conveyors handle single flat steel sheets



Moving hard-to-handle single 16-ft flat steel sheets from the seam welder to the roll former was solved by an eastern manufacturer of pipe through the installation of Live Rail units in an assembly consisting of nine rows of two units placed end to end. The conveyors are pitched slightly downward, are spaced 2 ft apart. Steel sheets move smoothly by gravity from one operation to the other, semi-automatically. *Alvey-Ferguson Co.*

For more data circle No. 37 on postcard, p. 143.

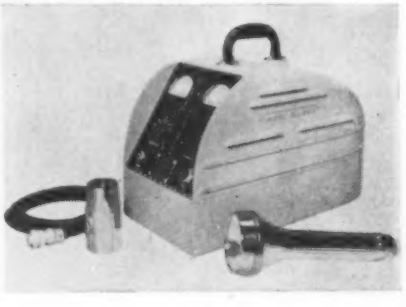


New deburring tools work well on all metals

Two new companion tools, Nobursink and Noburod, utilize a new principle for fast, efficient and economical deburring and chamfering of both inside and outside diameters. Nobursink for openly accessible hole faces and Noburod for the outer ends of rods, tubes and bosses, provide improved work quality, much faster and easier than before. Low torque design permits rapid off-hand workpiece handling without chatter or development of secondary burr, even on large diameters. Controlled cutter entry prevents snagging, seizing or excessive cutting. Both tools have two piece construction. *Nobur Mfg. Co.*

For more data circle No. 38 on postcard, p. 143.

Balances rotating parts at speeds up to 5000 rpm

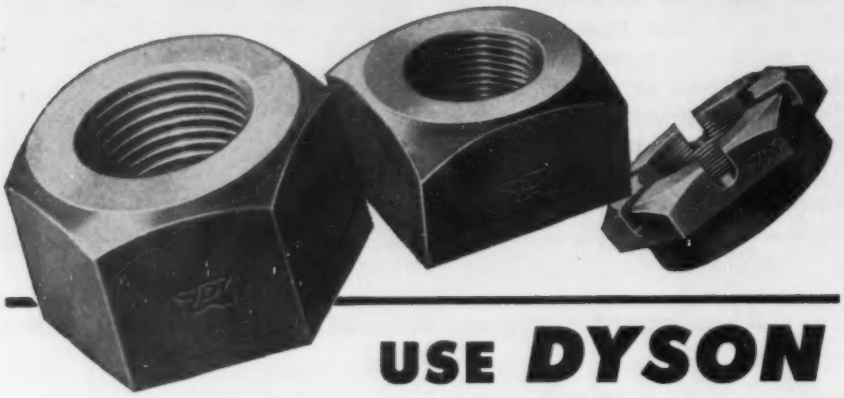


New portable electronic vibration analyzer is designed to eliminate vibration in production machinery and to simplify maintenance of plant equipment through dynamic balance of rotating parts. It is capable of balancing the rotating parts at speeds up to 5000 rpm and of tracing any vibration up to 20,000 cpm. Balancing, with the aid of a stroboscopic lamp with a range to 5000 flashes per min, is done through a short four-step procedure. Analysis data appear on panel meters. *International Research & Development Corp.*

For more data circle No. 39 on postcard, p. 143.

Turn Page

FOR YOUR **LARGE** FASTENERS



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GEO. F. MARCHANT COMPANY

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Aluminized clothing

New line of aluminized protective clothing includes all items, made from either aluminized asbestos or aluminized duck. Aluminized fabric reflects 90 pct of radiant heat; workers can operate in greater heat, and for longer periods. This hot-job protective apparel is lighter than previous types resulting in greater efficiency. Process for aluminizing the fabric makes the metal an integral part of the cloth. *American Optical Co.*

For more data circle No. 40 on postcard, p. 143.

Electronic relays

Two electronic relays surpassing military requirements for types AN3303-1 and AN3304-1 are both four PDT, continuous duty relays that can withstand 10-G high frequency vibration at 500 CPS; operation shock of 50-G; and will handle a 5 amp resistive contact

load. High operational and vibration characteristics of the units, both operable in any position, are attributed to a well-balanced and compact design; four-point suspension mounting, and extra efficient magnetic structure permitting high tension spring values on the blade. They weigh 0.500 lb and 0.225 lb respectively. Both are hermetically sealed. *U. S. Relay Co.*

For more data circle No. 41 on postcard, p. 143.

Non-glaring steel rules

Chrome finish steel rules are easier to read, rust and stain resistant and long wearing. The dull chrome finish makes reading easier in any light or at any angle and resists all kinds of corrosion-causing agents. No. 312 flexible steel rule is 6 in. long, graduated in 16ths, 32nds and 64ths. No. 316 tempered steel rules are 6 and 12 in. long, both graduated in 8ths, 16ths, 32nds and 64ths. *Brown & Sharpe Mfg. Co.*

For more data circle No. 42 on postcard, p. 143.

Coated-abrasive belt

Coated-abrasive Resinwet cloth belt is now made 50 in. wide. Field tests on various types of stainless steel show the new resin waterproof cloth belts have removed stock four times faster than other previous methods. The belts are safer and more effective because they use water as a coolant. *Michigan Abrasive Co.*

For more data circle No. 44 on postcard, p. 143.

Protective tape

Paper-backed protective tape is 100 pct resistant to outdoor exposure for protecting smooth surfaces during storage and fabrication. The tape features a film-like adhesive that sticks immediately

upon contact to such materials as stainless steel, aluminum (not anodized), glass, most plated metals, plastic glass, polystyrene, and polyester. The new black paper tape is said to withstand outdoor weathering for 6 months periods. Comes in 100-yd rolls in standard widths of 12, 24 and 36 in. *Minnesota Mining & Mfg. Co.*

For more data circle No. 45 on postcard, p. 143.

Turn Page

Precision barrel finishing of small intricate parts

Instrument manufacturers, laboratories, manufacturers of small parts will be interested in a new, small size barrel finishing unit for precision deburring and finishing small intricate parts, short runs or sample lots. Ruggedly constructed of prime heavy gage steel the Mity-Mite Jr. Deluxe is a cabinet style unit complete with ⅓ hp motor, 110 v, single phase and 8-ft cord. Octagonal barrel is 8x8 in. in size, neoprene rubber lined with quick acting clamps on access door. Floor space required is 18x20 in., overall height 36 in. Cabinet housing painted an eye-appealing green; barrel in yellow. *Speed-D-Burr Div., Miller Machine Tool & Gauge Shop.*

For more data circle No. 43 on postcard, p. 143.

There's something "special" about GAIRING Standard Counterbores . . . they are built and backed by the company which designed them. They're offered in HSS and TC-tipped up to 5" dia., of highest workmanship and quality materials. They're the best you can buy, accurate and dependable, the kind your shop can't afford to be without. Write for the Standard Catalog today.

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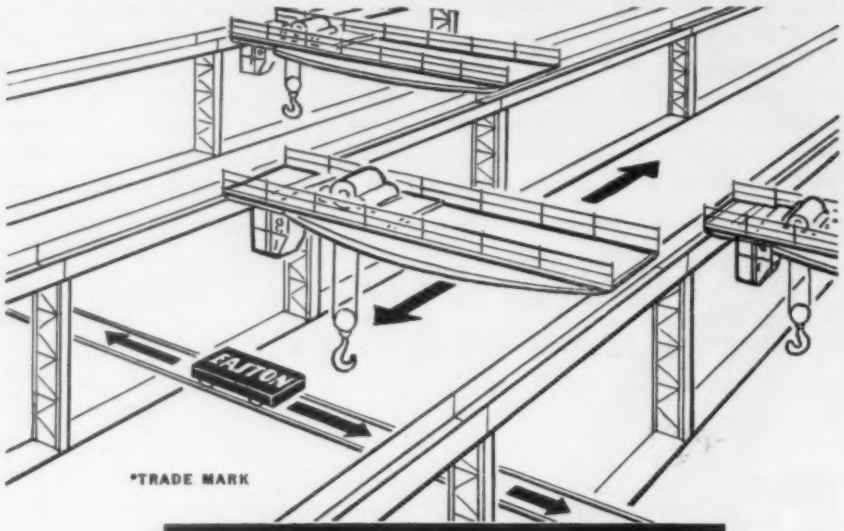

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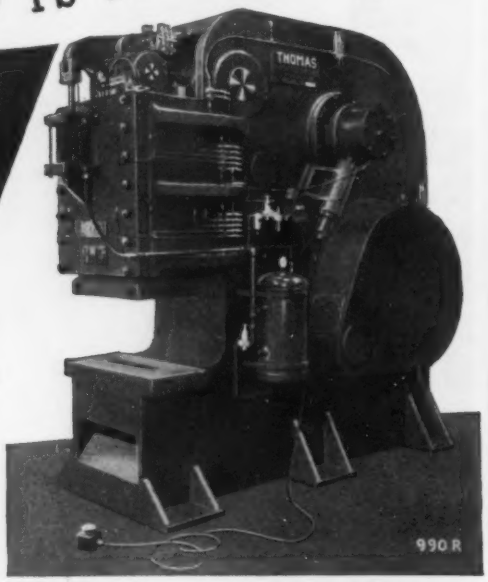


This Thomas All-Steel Punch or Shear has shearing or punching attachments which may be interchanged in a matter of minutes

For rounds, squares, flats, angles or channels

THOMAS MACHINE MANUFACTURING COMPANY
PITTSBURGH (23), PA.

28

PUNCHES • SHEARS • PRESSES • BENDERS • SPACING TABLES

Filmstrip projectors

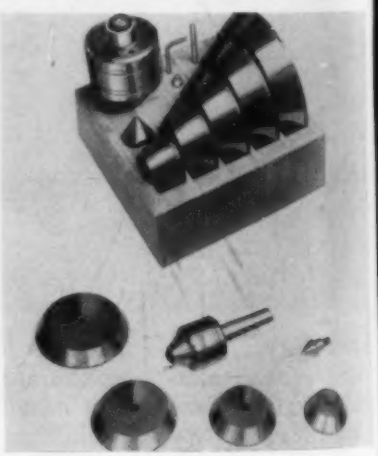
Six filmstrip projectors comprise a new line that includes two 300 and two 500 watt models and two single-purpose units in 150 and 300 watts. Designed for easy operation, the filmstrip projectors have only two operating controls, a film

advance and a framing control. A tilt knob is the only other adjustment. The new models project 33 mm filmstrip, both single and double frame, and 2 x 2 slides. A manual slide changer and an adjustable mask for single and double frame filmstrips are standard equipment. *Bell & Howell Co.*

For more data circle No. 46 on postcard, p. 143.

Live center sets

Designed for maximum efficiency, a combination live center set handles a broad range of work. With a set of six adaptors the live center provides a range from a point to a



6¼ in. diam bell. A quick lock feature enables the entire assembly to be locked for changing or regrinding and for specific jobs where dead centers are required. *Rockford Engineered Products Co.*

For more data circle No. 47 on postcard, p. 143.

Welder tip force gage

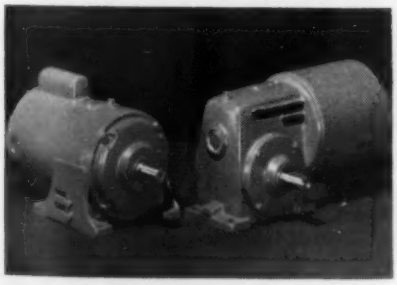
New low-cost gage accurately measures electrode force on spot welders. Capacity of the dual range instrument is up to 3000 lb in increments of 10 lb. The new design, using a light, high-strength

alloy in the dynamometer spring, permits manufacturing economies plus lightness, strength and accuracy. Instrument comes in a cork-lined, steel carrying case. *Peer, Inc.*

For more data circle No. 48 on postcard, p. 143.

FHP gear-motors

New line of fraction-horsepower gear-motors are right-angle and concentric-shaft motors, smaller and 10 pct lighter than previous models. Because the driving motor is a close-coupled and positively geared to the output shaft, the units offer maximum transmission of torque, uniform speed, and no slippage. Motors are reconnect-



able externally to reverse the direction of shaft rotation. Large bearings, with extra high thrust capacity, are locked to carry motor shaft thrust in either direction. Accurately matched gears, with large tooth sections, provide long life and quiet operation. Both motors are designed for use on machine tools, pumps, conveyors, strip feeders, etc. *General Electric Co.*

For more data circle No. 49 on postcard, p. 143.

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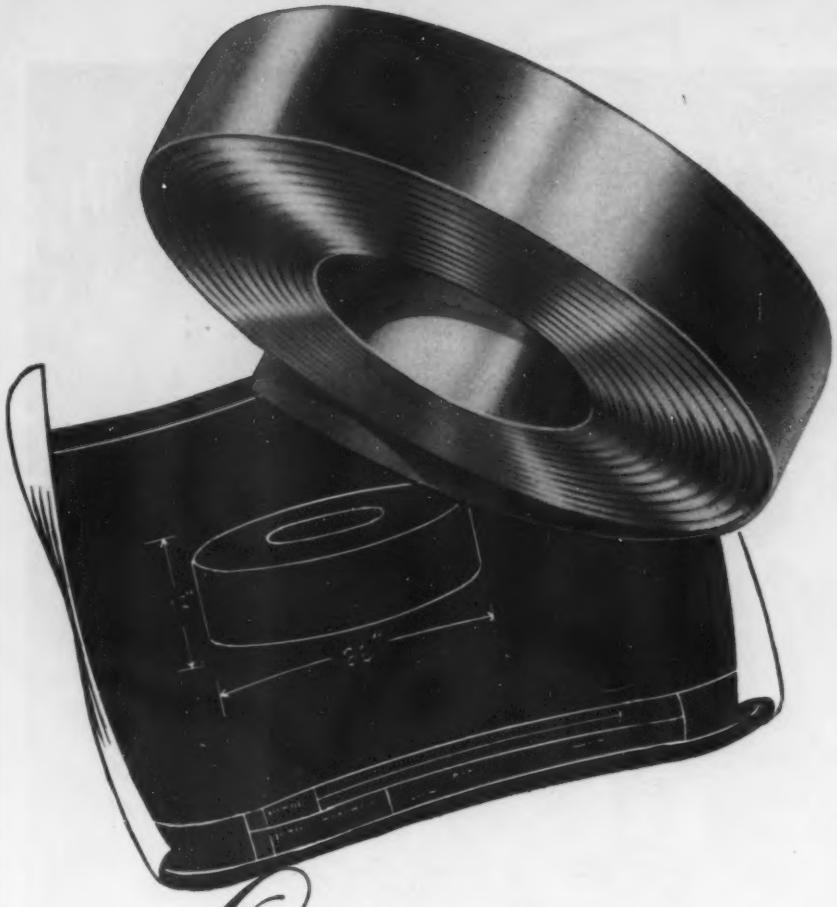

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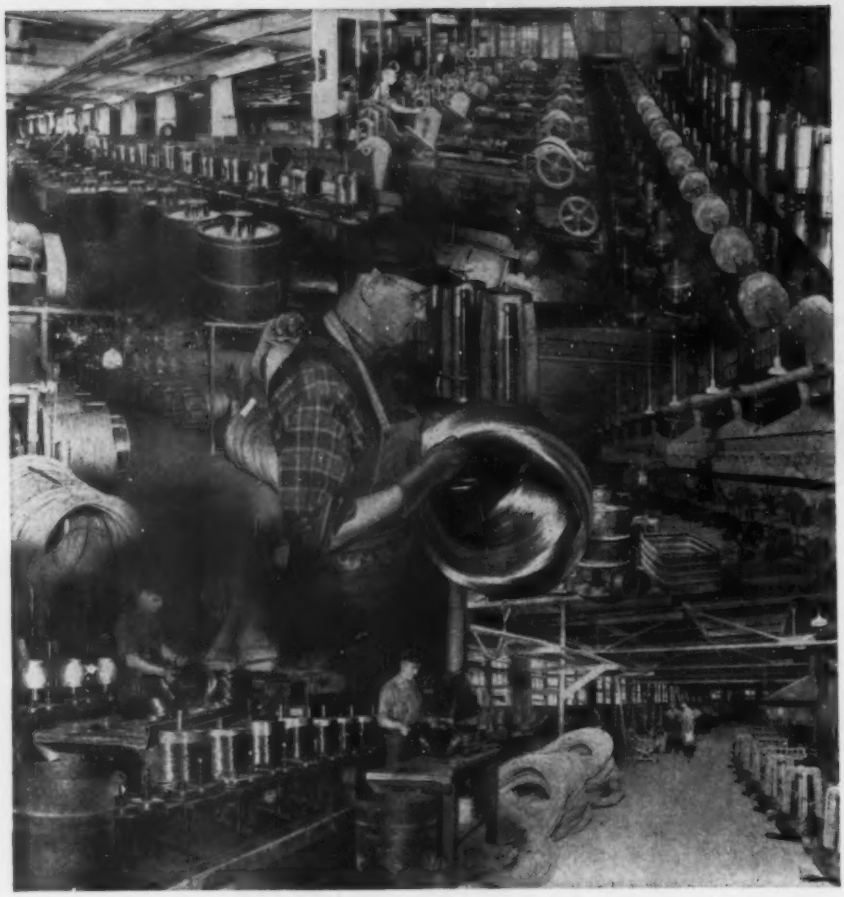

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American progress must not be confined to war alone. But discoveries that have their first conception in self preservation through force can be turned to use in peaceful pursuits. We are doing our part in defense production, but we also have a clear vision of work for a peaceful, happier America—carrying on with lessons war production has taught us—to meet in the most economical way the requirements of industry.

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Grinding coolant

New grinding coolant, Triple C, for all wet grinding operations may be put directly into water in the grinder where dissolving can take place in 2 min. It is compatible with heat-treating salts, makes stable solutions, maintains properties in even hardest water. Triple C is foamless, odorless, does not make ground materials slippery to handle when wet. Solutions are transparent. Triple C dissipates heat quickly. It does not impair filtration equipment operation. *Motch & Merryweather Machinery Co.*

For more data circle No. 50 on postcard, p. 143.

Storing bar stock

The Roto-Stacker has been developed for storing bar stock and various steel or other metal shapes. It is available in 10 and 30-ton capacity models. The units swivel on large Timken thrust bearings, making any piece quickly accessible for removal. The 30-ton model is provided with a hand cranking device, or can be electric motor rotated. The ceiling is the limit for the length of stock that can be stored vertically in the Roto-Stacker. Units can be located in any corner or odd spaces in the plant with their contents always accessible. Each unit is divided into eight compartments for the storage of stock. *H. L. Bushman Co.*

For more data circle No. 51 on postcard, p. 143.

Motorized hardness tester

Semi-automatic Rockwell motorized hardness tester, the Model Y, features a short test cycle to permit an increased number of Rockwell readings to be taken and recorded within a definite time period. The motor's function in the test cycle is to remove the major load. Cycle of major load operation is less than 2 sec. Its

application is controlled through a dash pot, which gives infinitely variable speed control. With its Set-O-Matic dial gage, the large hardness indicator pointer does not have to be set to zero manually as the pointer will automatically return to zero when the minor load is applied. *Wilson Mechanical Instrument Div., American Chain & Cable Co., Inc.*

For more data circle No. 52 on postcard, p. 143.

Stamping calculator

Pertinent specifications for small and medium size stampings may be determined with the BOA stamping calculator. With a single setting, the calculator will give answers for: blank diameters of cylindrical shells; number of drawing operations needed for producing the shell, and diameter and height of the shell in successive draws; bending allowances for any stock thickness, inside bending radius and any bending angle; developed punch radius for over form; weight of any kind of material needed for making the stamping. *BAO Slide Co.*

For more data circle No. 53 on postcard, p. 143.

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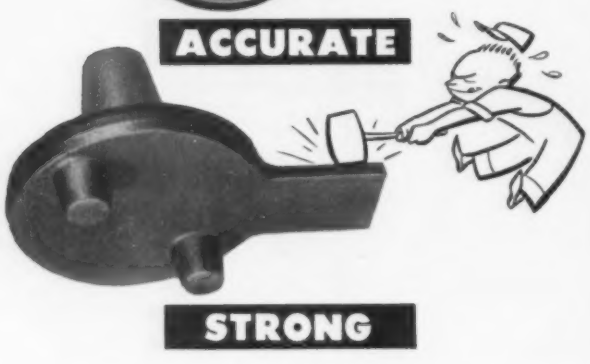

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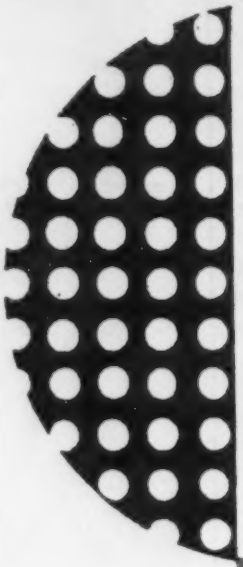

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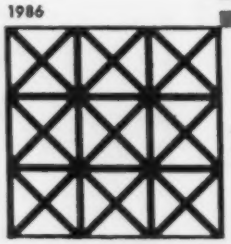
- Fabricating facilities include rolling, forming, shearing, welding and assembling.
- Perforating also done on plastic and composition material for sound conditioning.
- Material to be perforated can be supplied either by us or by your company.

1986



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The Iron Age SUMMARY . . .

Steel operating rate sinks 2 points to 62.0 pct of capacity, but business is still expected to improve . . . Scrap prices rise again.

Production . . . Growing confidence that the steel market will soon show improvement is not yet reflected in current production rates or order books.

As a matter of fact, steelmaking operations this week are scheduled at only 62.0 pct of rated capacity, a decline of 2 points from last week. Steel ingot production index is estimated at 92.2 (1947-49 = 100).

And, despite some improvement in the number of new orders, total tonnage on the books does not yet indicate any substantial upturn.

New Orders . . . August order books are closed, although you can still get quick delivery of moderate tonnages of most items by shopping around a bit. Mills can often give delivery quicker than indicated by their production cycles. They can do this by making short over runs on production orders, or by holding small tonnages of semi-finished steel which can be processed as emergency orders. Also, cancellations or requests to delay shipment sometimes make spot tonnages available.

Overall business in August will turn out to be about the same as July. A sharp decline in automotive steel orders is offset by an increase in miscellaneous orders from small users.

Eventually, automotive orders will undoubtedly pace an upturn in steel buying, as has been predicted. Still, it is something of a paradox that while national attention is focussed on the auto industry, anxiously watching for signs of life, orders from small manufacturers and parts makers are keeping production from sagging still lower.

Prices . . . While steel base prices are generally considered firm, efforts by several auto companies to breach the price line have been noted. So far they have not been successful. However, there has been at least one instance where specifications of material delivered were higher than was specified on the order. This is considered a form of price cutting, since the material was supposed to sell for more.

Scrap . . . After holding steady for a week, steelmaking scrap prices are moving upward again. Increases this week raised THE IRON AGE Steel Scrap Composite Price 84¢ a ton to $28.67 per gross ton. Chief strength is now in eastern markets where higher export prices are forcing domestic consumers to pay more or go without.

Steel Output, Operating Rates

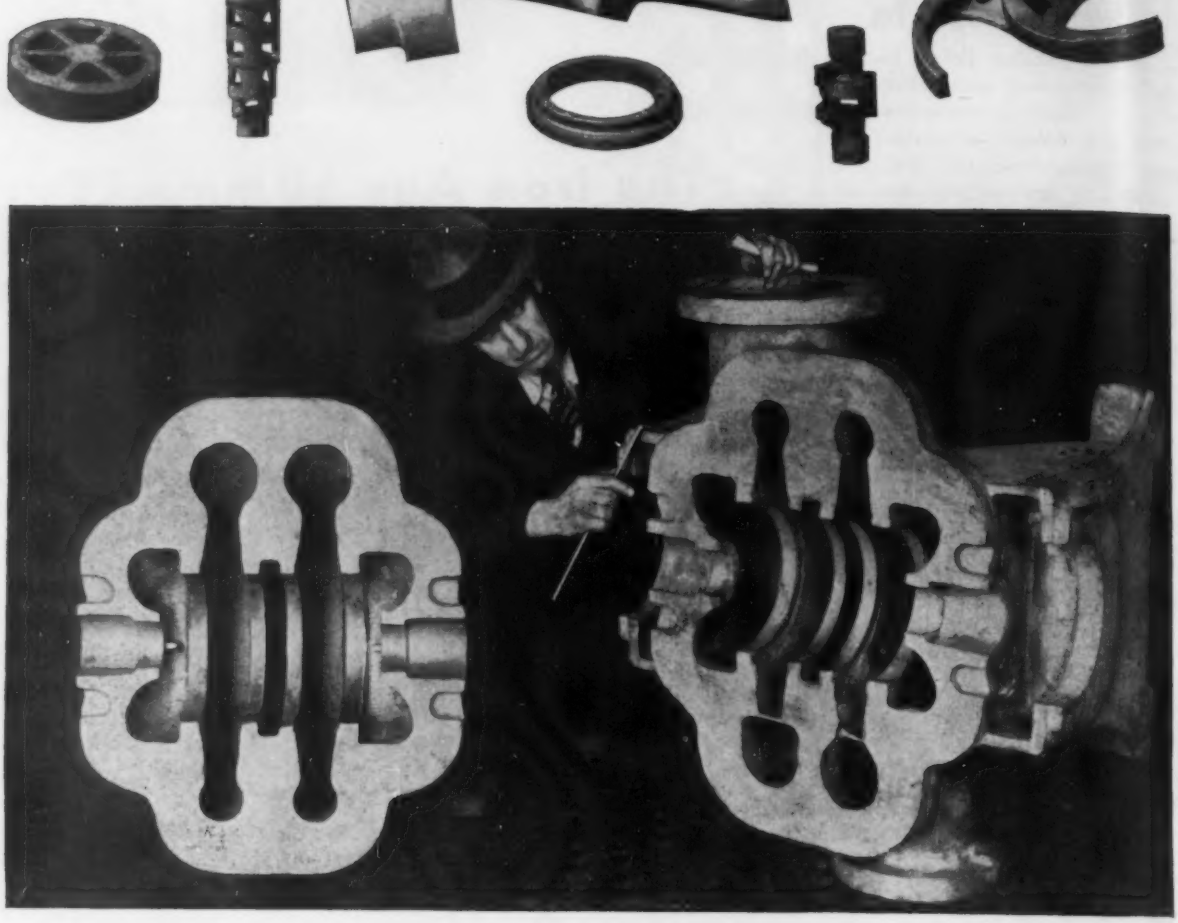
Production	This Week†	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	1,481	1,525	1,557	2,162
Ingot Index (1947—49=100)	92.2	94.9	96.9	134.6
Operating Rates				
Chicago	69.5	70.5*	68.5	102.0
Pittsburgh	59.0	61.0*	61.0	97.0
Philadelphia	56.0	56.0	56.0	96.0
Valley	58.0	58.0*	59.0	100.0
West	77.5	79.0*	81.5	99.0
Detroit	68.0	62.0	68.0	108.0
Buffalo	56.5	56.5	56.0	106.5
Cleveland	53.0	67.5*	63.0	93.0
Birmingham	58.0	64.5	76.0	94.0
S. Ohio River	72.0	72.0	68.0	83.5
Wheeling	84.0	86.0*	82.0	98.0
St. Louis	51.5	54.5	47.5	103.0
East	48.0	47.0*	32.0	99.0
Aggregate	62.0	64.0	64.5	96.0

* Revised. † Tentative

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite prices				
Finished Steel, base	4.801	4.801	4.801	4.634
Pig Iron (gross ton)	$56.59	$56.59	$56.59	$56.76
Scrap, No. 1 hvy (gross ton)	$28.67	$27.83	$26.83	$43.17
Nonferrous				
Aluminum, ingot	22.20	22.20	21.50	21.50
Copper, electrolytic	30.00	30.00	30.00	29.25
Lead, St. Louis	13.80	13.80	13.80	13.80
Magnesium, ingot	27.75	27.75	27.75	27.00
Nickel, electrolytic	63.08	63.08	63.08	63.08
Tin, Straits, N. Y.	93.125	93.375	96.625	83.00
Zinc, E. St. Louis	11.00	11.00	11.00	11.00



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AL® TIME-TESTED STAINLESS STEEL

WAD 5005 Warehouse stocks carried by all Ryerson Steel plants

Slump Plagues August Market

Vacation shutdowns stall predicted upturn . . . Oil country, galvanized sheets, structurals are strong, bars, wire, sheets, plate still weak . . . See September pickup.

♦ STEEL producers readily admit that August will not be as rosy as their crystal balls had indicated. Instead of the turn for the better they had confidently expected, the month may be the year's low point.

True, there are signs here and there that the recession is nearing an end, but that little extra nudge the market needs so badly has not materialized. The mills are setting their sights on September.

Steel sales executives say they underestimated the effect of consumer vacation shutdowns, which had been expected to end in July but which are continuing into August. Slack demand from the automotive industry is another big factor in the continuing dull market.

The market is still one of extremes. Oil country goods and galvanized sheets are strong. Structurals and other construction products, bolstered by the building boom, are firm. But weakness in other products is more than enough to offset the pull from the current favorites. Take your choice —sheets and strips, bars, tinplate, alloy, wire products, plates, stainless, tubular specialties—they're all in a buyer's market.

Warehouse business overall apparently has perked up slightly in the early weeks of August. But the distributors are keeping their fingers crossed; the market has been so erratic that demand may turn downward again before the month is over. Nevertheless, the warehouses believe they have seen the worst of it.

SHEETS AND STRIP . . . **Pittsburgh** producers find the market extremely competitive, look for no significant improvement until automobile producers come into the market for new model tonnages; some are optimistic that the push from Detroit will come in September. In **Chicago** the market is holding firm: cold-rolled sheets are on four-week delivery basis; inventories are considered to be low but no strong buying is looked for until mid-September. Galvanized sheets continue strong, are booked into November in the Chicago area. Demand for stainless sheets and strip is dull, although a producer in the **Pittsburgh** district reports a mild improvement in August over July.

STRUCTURAL AND PLATE . . . Structural demand is off slightly on the **West Coast**, where mill deliveries are fast and fabricator inventories apparently sufficient to accommodate current requirements. Several large tonnage jobs in the Los Angeles area have stimulated plate demand in the **West**; mills are sold through August, one of them through September; source of the flurry includes new refinery jobs and municipal water and power projects. In **Chicago**, structurals are obtainable on two weeks or less delivery basis but volume continues good, with wide-flange beams still setting the pace; plate demand continues to soften, although the current pace is about the same as in July. In the **East**, bridge, highway and general construction holding up the market for plate and structural. **Pittsburgh** mills are mildly content with the volume on both plates and structurals, but would feel better with heavier backlogs which they believe will materialize when the railroads re-enter the market; at the moment, there is no sign of renewed buying by the rails.

BARS . . . **Pittsburgh** producers say demand has picked up slightly, and they look for real improvement in September. In **Chicago**, the market is slow despite encouraging reports from producers of farm equipment; warehouse buying shows no improvement; hot-rolled is moving a little better than cold-finished, but neither is doing well. **The East** reports mild improvement in carbon bars and hopes for continued pickup in the fall months. In the **West**, bars are moving slowly.

TUBULAR . . . The market is spotty in **Chicago**; welded and seamless demand is good, but buttweld is off; mechanical tubing described as fair. The usual optimistic reports from **Pittsburgh** district mills on oil country goods; line-pipe potential is good, current market only fair; buttweld pipe is fair, but strictly competitive, with delivery a big factor.

WIRE PRODUCTS . . . Slack farm demand has hit merchant wire market in the **East**, but nails and reinforcing mesh are firm in line with high level of construction. In **Chicago**, manufacturers wire and automotive wire continue to slip, but mills are holding to high productive levels; demand for wire mesh is good and outlook is bright. In **Pittsburgh**, construction products are in strong demand but the market for manufacturers wire and merchant wire is only fair.

WAREHOUSE . . . **West Coast** market is slow, with consumers apparently buying just enough to maintain inventories; outlook for September is better. **Chicago** reports mild pickup, confirmed at both distributor and mill level; inventory reduction, particularly in strip, continues; prospects for continuation of current uptrend in September considered good. In **Cleveland**, volume has picked up about 3 pct in last four weeks, according to one outlet; August was off to an encouraging start but no one is willing to predict the trend will continue; warehouses picking up some business from consumers who normally buy from mills; this comes about through sudden need for shapes and sizes not quickly obtainable.

Purchasing Agent's Checklist

AIR CONDITIONING: Industry's growth assured ..... p. 73

REFRACTORIES: Competition trims some firms' prices .. p. 79

STEEL: Consumption leads today's shipments ..... p. 81

STAMPINGS: Upturn comes into view ..... p. 85

May Offer Lead-Zinc Subsidy

President has pledged aid to lead-zinc miners . . . Postponed action on recommendation for higher tariffs . . . Answer may be government subsidy plan—By *R. L. Hatschek.*

◆ BIGGEST question in nonferrous metals today is: What is President Eisenhower going to do about boosting lead and zinc? And when is he going to do it?

He has, both privately and publicly, pledged aid to these stricken metals. But when the U. S. Tariff Commission recommended a boost in tariffs, President Eisenhower did not move. Action had been anticipated in the customary 60 days following the recommendation. But at the end of that period he formally postponed action.

It is reported that both the President and Secretary of State Dulles oppose higher tariffs as being against the free trade policies of the Administration.

But having pledged aid to the lead-zinc mining industry, the President must have some action in mind. He must come up with an alternative that will bolster the sagging markets without restricting foreign trade. It may be the subsidy plan now reported under consideration in Washington. It may also be that he was waiting to see what effect the "new look" stockpiling program would have on the markets.

The President has now had his look at stockpiling effects—it has prevented any further softening and established a floor price for both metals. But it hasn't created any real strength or resulted in any improvement in prices. Why does he continue to wait?

Fact is that the President is apparently waiting until after Congress adjourns. Washington observers speculate that this indicates he'll favor the subsidy plan and is waiting to avert a stormy reaction such as his wool subsidy plan created earlier among the lawmakers.

LEAD, ZINC . . . Top Presidential advisers were meeting at the White House late last week in an attempt to hammer out a decision on how to bolster the sagging lead and zinc industry. Prospects are that basic policy will be announced soon after Congress adjourns.

Two alternatives are being considered: (1) higher tariffs or (2) a government subsidy. Higher tariffs were recommended by the U. S. Tariff Commission in May. But President Eisenhower failed to act on the recommendation and extended somewhat the usual 60-day period.

Reportedly receiving consideration is a bonus plan backed by State Dept. This calls for the government to give incentive grants of 4¢ per lb on the first 200 tons each domestic mine produces each month.

Meanwhile, markets for both metals were fairly quiet last week. There's been some surprise expressed at the lack of lead buying by battery manufacturers. Traditional practice has been for them to buy heavily at this time and taper off in the fall. Lead industry now feels that battery makers, because of the late start, may buy right through to the end of the year.

COPPER . . . As anticipated, July deliveries of copper to fabricators dipped considerably. This, of course, was due to vacations. Copper Institute figures show July domestic deliveries at 97,436 tons (June, 106,252 tons) and deliveries outside the U. S. at 105,216 tons (June, 130,322 tons). Stockpile shipments are estimated at about 22,000 tons.

Domestic crude production was off some 11,600 tons to 66,585 tons including both primary and secondary while foreign output rose about 7700 tons to 132,497 for both categories. July refined production was down 5000 tons to 107,095 tons in the U. S. and rose 17,000 tons to 105,762 tons outside the U. S.

Total refined stocks held at the beginning of August dropped 10,353 tons to 239,479 tons, largely as a result of the stockpile shipments. This breaks down to 68,921 tons held in the U. S., 170,558 tons held outside the U. S. Big drop was in the foreign stocks which went down 10,093 tons while domestic stocks eased off only 260 tons.

Kennecott Copper Corp. and the International Union of Mine, Mill and Smelter Workers have been unable to come to a mutually satisfactory agreement and the union struck four western properties on Monday. These include mining, concentrating and smelting facilities. Strike means a production loss of about 1700 tons daily. Hassle, of course, is over wages and fringe benefits. Kennecott offered 7¢ per hour, including 2.2¢ in hospital and medical benefits. But Mine, Mill wants 8¢ plus fringes.

ALUMINUM . . . Still another new primary aluminum production record was rolled up in July—126,162 net tons for the month. This tops the previous record (May 1954) by 1000 tons and the previous month by 5400 tons. Total output for the first 7 months of 1954 was 841,561 tons. There's no question that the year will wrap up a new annual record—but how big it will be depends on how much rain falls in the next few months.

Secondary aluminum ingot prices have followed the prices of primary ingot and new price sheets have now been issued for most mill products. New quotations will be found on page 180.

Daily Nonferrous Metal Prices

(Cents per lb except as noted)

	Aug. 11	Aug. 12	Aug. 13	Aug. 14	Aug. 16	Aug. 17
Copper, electro, Conn.	30.00	30.00	30.00	30.00	30.00	30.00
Copper, Lake, delivered	30.00	30.00	30.00	30.00	30.00	30.00
Tin, Straits, New York	92.875	92.625	92.625	....	93.125	93.125*
Zinc, East St. Louis	11.00	11.00	11.00	11.00	11.00	11.00
Lead, St. Louis	13.80	13.80	13.80	13.80	13.80	13.80

Note: Quotations are going prices **Tentative*

COPPER DETERMINATION

Alloymet 2030 (65% Nickel 30% Copper 5% Iron)*

A product of close Metallurgical CONTROL for the production of low alloy steel and gray iron

Pre-alloyed master alloys are leaving an indelible mark on the iron and steel industry. The element of human error is reduced many fold, since a single alloying agent, *ALLOYMET* 2030 ingot or shot, can replace many separate inoculants. A single trial of Alloymet 2030 or its companion alloys will make you an "Alloymet regular."

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*Nominal Chemical Composition

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Alloy Metal Division
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Phone 6-2561 Teletype DV 588

Nonferrous Prices

(Effective Aug. 17, 1954)

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb. f.o.b. ship. pt., frt. allowed)

Flat Sheet: 0.136-0.249 in, 2S, 3S, 34.9¢; 4S, 37.1¢; 52S, 39.2¢; 24S-O, 24S-OAL, 38.3¢; 75 S-O, 75S-OAL, 45.8¢; 0.081 in., 2S, 3S, 36.1¢; 4S, 38.8¢; 52S, 40.9¢; 24S-O, 24S-OAL, 39.8¢; 75S-O, 75S-OAL, 48.1¢; 0.032 in., 2S, 3S, 38.1¢; 4S, 43.0¢; 52S, 45.7¢; 24S-O, 24S-OAL, 48.4¢; 75S-O, 75S-OAL, 59.8¢.

Plate, ¼-in. and heavier: 2S-F, 3S-F, 33.6¢; 4S-F, 35.7¢; 52S-F, 37.4¢; 61S-O, 36.8¢; 24S-O, 24S-OAL, 38.4¢; 75S, 75S-OAL, 45.8¢.

Extruded Solid Shapes: Shape factors 1 to 5, 37.7¢ to 55.7¢; 12 to 14, 38.4¢ to $1.03; 24 to 26, 41.2¢ to $1.34; 36 to 38, 48.8¢ to $1.96.

Rod, Round: Rolled, 1.064-4.5 in., 2S-F, 42.6¢ to 39.1¢; cold finished, 0.375-3.499 in., 2S-F, 46.9¢ to 41.4¢.

Screw Machine Stock: Rounds, 11S-T3, ⅛-11/32 in., 62.5¢ to 49.1¢; ⅜-1½ in., 48.9¢ to 45.9¢; 1 9/16-3 in., 44.7¢ to 41.7¢. Base 5000 lb.

Drawn Wire: Coiled, 0.051-0.374 in., 2S, 46.1¢ to 34.8¢; 52S, 55.7¢ to 43.4¢; 17S-T4, 63.3¢ to 43.7¢; 61S-T4, 58.5¢ to 43.1¢.

Extruded Tubing: Rounds, 63S-T5, OD 1¼-2 in., 43.4¢ to 63.8¢; 2-4 in., 39.3¢ to 53.6¢; 4-6 in., 39.8¢ to 48.8¢; 6-9 in., 40.4¢ to 51.1¢.

Roofing Sheet: Flat, per sheet, 0.032-in. 42¾ x 60-in., $2.918; x 96-in., $4.672; x 120-in., $5.841; x 144-in., $7.009. Coiled sheet, per lb, 0.019 in. x 28 in., 29.9¢.

Magnesium

(F.o.b. mill, freight allowed)

Sheet & Plate: FS1-O ¼ in., 56¢; 3/16 in., 57¢; ⅛ in., 60¢ 0.064 in., 73¢; 0.032 in., 94¢. Specification grade higher. Base 30,000 lb.

Extruded Round Rod: M, diam ¼ to 0.311 in., 77¢; ½ to ¾ in., 60.5¢; 1¼ to 1.749 in., 56¢; 2½ to 5 in., 51.5¢; Other alloys higher. Base up to ¾ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes: Rectangles: M. In weight per ft, for perimeters less than size indicated; 0.10 to 0.11 lb, 3.5 in., 65.3¢; 0.22 to 0.25 lb, 5.9 in., 62.3¢; 0.50 to 0.59 lb, 8.6 in., 59.7¢; 1.8 to 2.59 lb, 19.5 in., 56.8¢; 4 to 6 lb, 28 in., 52¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ½ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness: OD, ¼ to 5/16 in., $1.43; 5/16 to ⅜ in., $1.29; ½ to ⅝ in., 96¢; 1 to 2 in., 79¢; 0.165 to 0.219 in. wall; OD, ⅝ to ¾ in., 64¢; 1 to 2 in., 60¢; 3 to 4 in., 59¢. Other alloys higher. Base, OD: Up to 1½ in., 10,000 lb; 1½ to 3 in., 20,000 lb; over 3 in., 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades; Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $11; Bar, HR or forged, $6; Forgings, $6.

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	86½	67½	92½
Strip, CR	92½	70½	98½
Rod, bar	82½	65½	88½
Angles, HR	82½	65½	88½
Plate, HR	84½	66½	90½
Seamless tube	115½	100½	137½
Shot, blocks	....	60	....

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	46.41	....	45.48
Copper, h-r	48.38	44.73	....
Copper, drawn	....	45.98	....
Low brass	44.47	44.41	....
Yellow brass	41.72	41.66	....
Red brass	45.44	45.38	....
Naval brass	45.76	40.07	....
Leaded brass	....	....	39.11
Com. bronze	46.95	46.89	....
Mang. bronze	49.48	43.62	45.18
Phos. bronze	66.58	67.08	....
Muntz metal	43.96	39.77	41.02
Ni silver, 10 pct	55.36	....	62.63

Beryllium copper, CR, 1.9% Be, Base 2000 lb, f.o.b.

Strip	$1.68
Rod, bar, wire	1.65

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	22.20
Aluminum pig	20.50
Antimony, American, Laredo, Tex.	28.50
Beryllium copper, per lb conta'd be.	$40.00
Beryllium aluminum 5% Be, Dollars per lb contained Be	$72.75
Bismuth, ton lots	$2.25
Cadmium, del'd	$1.70
Cobalt, 97-99% (per lb)	$2.60 to $2.67
Copper, electro, Conn. Valley	30.00
Copper, Lake, delivered	30.00
Gold, U. S. Treas., per troy oz.	$35 00
Indium, 99.8%, dollars per troy oz.	$2 25
Iridium, dollars per troy oz.	$165 to $175
Lead, St. Louis	13.80
Lead, New York	14.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb, pig	27.00
ingot	27.75
Magnesium, sticks, 100 to 500 lb,	46.00 to 48.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$290 to $293
Nickel electro, f.o.b. N. Y. warehouse	63.08
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	56.25
Palladium, dollars per troy oz.	$21.00
Platinum, dollars per troy oz.	$84 to $87
Silver, New York, cents per troy oz.	85.25
Tin, New York	93.125
Titanium, sponge, grade A-1	$4.72
Zinc East St. Louis	11.00
Zinc New York	11.50
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	27.00-28.50
No. 120	26.25-27.75
No. 123	25.75-27.25
80-10-10 ingot	
No. 305	31.50-33.00
No. 315	29.25-30.75
88-10-2 ingot	
No. 210	41.25-41.75
No. 215	37.75-38.25
No. 245	33.25-33.75
Yellow ingot	
No. 405	23.25-24.25
Manganese bronze	
No. 421	26.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	23.25-23.50
0.60 copper, max.	23.00-23.25
Piston alloys (No. 122 type)	20.25-21.75
No. 12 alum. (No. 2 grade)	19.50-20.25
108 alloy	20.25-20.50
195 alloy	21.00-23.00
13 alloy (0.60 copper max.)	23.00-23.25
ASX-679	20.25-20.50

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—96-97½%	21.00-21.50
Grade 2—92-95%	20.00-20.50
Grade 3—90-92%	19.00-19.50
Grade 4—85-90%	18.00-18.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 5000 lb lots)

Copper	
Cast, oval, 15 in. or longer	42.64
Electrodeposited	41.88
Flat rolled	45.04
Brass, 80-20	
Cast, oval, 15 in. or longer	43.515
Zinc, flat cast	20.25
Ball, anodes	18.50
Nickel, 99 pct plus	
Cast	84.00
Cadmium	$1.70
Silver 999 fine, rolled, 100 oz. lots per troy oz., f.o.b. Bridgeport, Conn.	94⅛

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63.00
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	30.00
Nickel chloride, 375 lb drum	38.00
Silver cyanide, 100 oz. lots, per oz.	75½
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	54.30

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	26	25¼
Yellow brass	19¾	18
Red brass	23	22¼
Comm. bronze	22⅞	21⅞
Mang. bronze	18¾	17¼
Yellow brass rod ends	19½	....

Custom Smelters' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	26¾—27
No. 2 copper wire	25¼—25½
Light copper	23¾—24
*Refinery brass	22¾—23

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	26¾—27
No. 2 copper wire	25¼—25½
Light copper	23¾—24
No. 1 composition	21½
No. 1 comp. turnings	20½
Rolled brass	17
Brass pipe	18½
Radiators	17¾—18
Aluminum	
Mixed old cast	13 —13½
Mixed new clips	14 —14½
Mixed turnings, dry	13¼—13½
Pots and pans	13 —13½

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	24½—25
No. 2 heavy copper and wire	23 —23¼
Light copper	21 —21¼
New type shell cuttings	20¼
Auto radiators (unsweated)	15
No. 1 composition	19 —19¼
No. 1 composition turnings	18½—19
Unlined red car boxes	16
Cocks and faucets	16 —16½
Mixed heavy yellow brass	13
Old rolled brass	15¼
Brass pipe	16½—17
New soft brass clippings	18
Brass rod ends	16
No. 1 brass rod turnings	15
Aluminum	
Alum. pistons and struts	7 — 8
Aluminum crankcases	10
2S aluminum clippings	13
Old sheet and utensils	10
Borings and turnings	6 — 7
Misc. cast aluminum	10
Dural clips (24S)	11
Zinc	
New zinc clippings	6 — 6¼
Old zinc	4¾— 5
Zinc routings	3 — 3¼
Old die cast scrap	3 — 3¼
Nickel and Monel	
Pure nickel clippings	60 —65
Clean nickel turnings	40
Nickel anodes	60 —65
Nickel rod ends	60 —65
New Monel clippings	23 —25
Clean Monel turnings	16 —18
Old sheet Monel	21 —23
Nickel silver clippings, mixed	15
Nickel silver turnings, mixed	13
Lead	
Soft scrap lead	11 —11¼
Battery plates (dry)	5¾— 6
Batteries, acid free	4½
Magnesium	
Segregated solids	18½—19
Castings	17½—18
Miscellaneous	
Block tin	75 —80
No. 1 pewter	55 —60
No. 1 auto babbitt	45
Mixed common babbitt	12 —12½
Solder joints	16½
Siphon tops	45
Small foundry type	15½
Monotype	14
Lino. and stereotype	13
Electrotype	11½
Hand picked type shells	8½
Lino. and stereo. dross	5½
Electro dross	4

Bell by Bevin Bros., East Hampton, Conn.

"Come and Get It!"

Keynoter of countless cook-outs is the music every hungry guest waits to hear . . . the 4-word hit song, "*Come and Get It!*" . . . ringing out in the golden tones of mellow, *solid* Brass.

No other metal has this vivid voice . . . in bells . . . or in any other instrument from trumpets to trombones to cymbals. And it takes a Brass mill with a healthy respect for its own product to turn out "bell-toned" Brass that manufacturers keep coming back for, year after year.

Now whether *you* use Brass for bells or buttons . . . cartridges or clocks . . . pencils or projectiles . . . you can get *here at Bristol* the fine strip, rod, or wire you need for any component of your product. So the *solid* Bristol Brass bell rings out a special summons for *you:* "Come and Get It". (*You'll never regret it!*)

THE BRISTOL BRASS CORPORATION

has been making Brass strip, rod and wire here in Bristol, Connecticut since 1850, and has offices and warehouses in Boston, Chicago, Cleveland, Detroit, Milwaukee, New York, Philadelphia, Providence, Rochester. The Bristol Brass Corporation of California, 1217 East 6th St., Los Angeles 21. The Bristol Brass Corp. of Ohio, 1607 Broadway, Dayton.

"Bristol-Fashion" means **Brass at its Best**

Trade Waits On Fall Upswing

Some mills step up buying, although general tone is still dull . . . Belief in more orders, higher prices next month widespread . . . Eastern buying ups Composite.

◆ WHILE the overall picture continued to be gray in tone, many in the trade thought they saw signs of an order and price upturn next month. Among the omens cited:

1. There is widespread belief that the steel industry's operating rate will move up in the fall.

2. Some mills have stepped up scrap buying, a few after fairly long absence from the marketplace.

3. East Coast mills are raising buying prices to compete with export orders, although in most cases they are also taking advantage of freight arbitrages.

4. Dealers and brokers generally have shown very little inclination to dump laid-down scrap, but rather have been holding out grimly for higher prices.

5. In the East at least, supplies of No. 1 steel and other quality grades have been almost exhausted by export orders.

6. Long shutdowns for model changeovers by the hardpressed auto industry will dry up for some time normal supplies of automotive scrap, important to Midwest mills.

Higher mill buying prices in the Philadelphia area raised THE IRON AGE No. 1 Heavy Melting Steel Scrap Composite Price 84¢ to $28.67 per gross ton.

Pittsburgh . . . Market here is dull. Consumers show little interest in buying, and brokers are reluctant to let go of material which they have been holding in hope of selling at current or even better prices. There is little if any inclination or incentive to pull remote material into this area. A fair sized order for low phos raised that grade $1. Railroad grades are also up 50¢ to $1.

Chicago . . . Chicago scrap was hanging in the balance last week, and in the absence of mill buying broker buying prices were beginning to subside from the high reached 2 weeks ago. Indicative of the sensitivity of the market, one firm was reducing its dealer buying prices by $1, but feels it would have to raise them by $1.00 to $1.50 if a new mill order came in. Market forecasters have been blowing hot and cold. In a period of about 5 days, the bottom fell out of a bullish forecast with at least several dealers offering their turnings at $1 less. Yet brokers argue that if a mill sale hits, they'll quite probably have to raise their buying price again within the week.

Philadelphia . . . Re-entry of at least three mills into the market raised prices as domestic consumers started to compete with export orders. But orders were not placed in Philadelphia proper, where exports still carry at least $1 premium over new domestic prices. Local mills are taking advantage of a freight arbitrage, paying higher prices to upstate suppliers than they could receive on exports. The trade warns that stocks of No. 1 material in the area have been virtually exhausted. Both exporters and local mills will probably have to pay more for quality material in September. And it is rumored that material now moving to mills is of poor quality despite higher prices for new orders.

New York . . . While scrap traders continued to concentrate on exports, there were definite signs of renewed interest by domestic consumers. At least one mill was buying at current prices from New Jersey yards which were handicapped in export sales by freight charges.

Detroit . . . Activity in Detroit consists of filling old orders at current prices. The trade is balancing low operating rates locally and out of district against the fact that almost no automotive scrap will be generated in late August and September.

Cleveland . . . Market remained in mid-month doldrums while dealers continued optimistic for some revival next month. Some small sales on No. 1 grades and turnings reported at prevailing prices.

Birmingham . . . Local steel mills are still purchasing at previously established prices, and although the area from which they are drawing is limited, the scrap that they are receiving seems to be filling their needs. Export quotations are the only bright light in an otherwise dull market. These are varied and, of course, change for each port depending on the stevedoring and wharfage charges. Considerable scrap has been bought out of the ports and nearby vicinities. Cast scrap is still in heavy demand.

St. Louis . . . Steel operating rate is down again to 51.4, lowest in some time. Therefore, buying of scrap has been light since it is only in line with the melt, and such supplies can be had readily from nearby points. Farm implement trade is dull. Cast grades are quiet with the exception of heavy breakable cast and motor blocks which are in better demand. Prices are unchanged.

Cincinnati . . . Demand for turnings and borings by ferroalloy producers is brightest spot in market. Choice No. 1 bundles are also moving but other grades are in poor demand. Competition expected to be good for industrial scrap list in area due for sale next month.

Buffalo . . . New buying interest among mills was shown in small sales of steelmaking grades at inside figures of current ranges. The trade, however, is generally marking time as dealers ship against old orders. Additional tonnage of No. 1 material is moving from here to Valley buyers.

Boston . . . A little export business is still helping keep yards going. No. 2 bundles are up $2 this week, but most demand is for better grades. Prices in this market are for full carloads.

West Coast . . . Hottest item this summer, cast scrap, now cooling off. Market is softening in Seattle and Los Angeles, though still strong in San Francisco. With foundry inventories practically built up, decreasing demand is looked for through August. Future movement will depend on foundry work orders.

A SYMBOL OF LEADERSHIP
IN IRON & STEEL SCRAP
SINCE 1889

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SEATTLE, WASH.

EXPORTS-IMPORTS — LIVINGSTON & SOUTHARD, INC. 99 Park Ave., New York, N. Y. *Cable Address:* FORENTRACO

Scrap Prices

(Effective Aug. 17, 1954)

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 bundles	29.00 to 30.00
No. 2 bundles	23.00 to 24.00
Machine shop turn.	15.50 to 16.50
Mixed bor. and ms. turns.	15.50 to 16.50
Shoveling turnings	19.50 to 20.50
Cast iron borings	18.00 to 19.00
Low phos. punch'gs, plate	32.00 to 33.00
Heavy turnings	27.00 to 28.00
No. 1 RR. hvy. melting	31.50 to 32.50
Scrap rails, random lgth.	37.00 to 38.00
Rails 2 ft and under	43.00 to 44.00
RR. steel wheels	35.00 to 36.00
RR. spring steel	35.00 to 36.00
RR couplers and knuckles	35.00 to 36.00
No. 1 machinery cast.	42.00 to 43.00
Cupola cast.	34.00 to 35.00
Heavy breakable cast.	30.00 to 31.00

Chicago

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 factory bundles	32.00 to 33.00
No. 1 dealers' bundles	29.00 to 30.00
No. 2 dealers' bundles	21.00 to 22.00
Machine shop turn.	14.00 to 15.00
Mixed bor. and turn.	16.00 to 17.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Low phos. forge crops	35.00 to 36.00
Low phos. punch'gs, plate	33.00 to 34.00
Low phos. 3 ft and under	32.00 to 33.00
No. 1 RR. hvy. melting	32.00 to 33.00
Scrap rails, random lgth.	36.00 to 37.00
Reroling rails	43.00 to 44.00
Rails 2 ft and under	43.00 to 44.00
Locomotive tires, cut	33.00 to 34.00
Cut bolsters & side frames	35.00 to 36.00
Angles and splice bars	37.00 to 38.00
RR. steel car axles	40.00 to 41.00
RR. couplers and knuckles	35.00 to 36.00
No. 1 machinery cast.	39.00 to 40.00
Cupola cast	36.00 to 37.00
Heavy breakable cast.	29.00 to 30.00
Cast iron brake shoes	31.00 to 32.00
Cast iron car wheels	33.00 to 34.00
Malleable	40.00 to 41.00
Stove plate	29.00 to 30.00

Philadelphia Area

No. 1 hvy. melting	$26.50 to $27.50
No. 2 hvy. melting	24.50 to 25.50
No. 1 bundles	26.50 to 27.50
No. 2 bundles	18.00 to 19.00
Machine shop turn.	14.00 to 15.00
Mixed bor. short turn.	15.00 to 16.00
Cast iron borings	15.00 to 16.00
Shoveling turnings	17.00 to 18.00
Clean cast chem. borings.	20.00 to 21.00
Low phos. 5 ft and under	28.00 to 29.00
Los phos. 2 ft and under	29.00 to 30.00
Low phos. punch'gs	29.00 to 30.00
Elec. furnace bundles	26.50 to 27.50
Heavy turnings	24.00 to 25.00
RR steel wheels	31.50 to 32.50
RR. spring steel	31.50 to 32.50
Rails 18 in. and under	41.00 to 42.00
Cupola cast.	34.00 to 35.00
Heavy breakable cast.	35.00 to 36.00
Cast iron carwheels	38.00 to 39.00
Malleable	36.00 to 37.00
Unstripped motor blocks.	27.00 to 28.00
No. 1 machinery cast.	40.00 to 41.00
Charging box cast.	36.00 to 37.00

Cleveland

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 bundles	28.00 to 29.00
No. 2 bundles	23.00 to 24.00
No. 1 busheling	28.00 to 29.00
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	16.00 to 17.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Cut struct'r'l & plate, 2 ft & under	31.50 to 32.50
Drop forge flashings	26.00 to 27.00
Low phos. 2 ft & under	30.00 to 31.00
No. 1 RR. heavy melting	29.00 to 30.00
Rails 3 ft and under	42.00 to 43.00
Rails 18 in. and under	43.00 to 44.00
Railroad grate bars	27.00 to 28.00
Steel axle turnings	19.00 to 20.00
Railroad cast.	41.00 to 42.00
No. 1 machinery cast.	41.00 to 42.00
Stove plate	34.00 to 35.00
Malleable	40.00 to 41.00

Youngstown

No. 1 hvy. melting	$29.00 to $31.00
No. 2 hvy. melting	25.00 to 27.00
No. 1 bundles	30.00 to 32.00
No. 2 bundles	23.00 to 25.00
Machine shop turn.	14.00 to 15.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Low phos. plate	30.00 to 32.00

Buffalo

No. 1 hvy. melting	$26.00 to $27.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 busheling	26.00 to 27.00
No. 1 bundles	26.00 to 27.00
No. 2 bundles	20.00 to 21.00
Machine shop turn.	14.50 to 15.50
Mixed bor. and turn.	17.50 to 18.50
Shoveling turnings	18.00 to 18.50
Cast iron borings	17.50 to 18.50
Low phos. plate	29.00 to 30.00
Scrap rails, random lgth.	33.00 to 34.00
Rails 2 ft and under	40.00 to 41.00
RR. steel wheels	34.00 to 35.00
RR. spring steel	34.00 to 35.00
RR. couplers and knuckles	34.00 to 35.00
No. 1 machinery cast.	38.00 to 39.00
No. 1 cupola cast.	34.00 to 35.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$22.00 to $23.00
No. 2 hvy. melting	18.00 to 19.00
No. 1 bundles, openhearth	23.00 to 24.00
No. 2 bundles	16.00 to 17.00
New busheling	21.00 to 22.00
Drop forge flashings	21.00 to 22.00
Machine shop turn.	7.00 to 8.00
Mixed. bor. and turn.	9.00 to 10.00
Shoveling turnings	9.00 to 10.00
Cast iron borings	9.00 to 10.00
Low phos. punch'gs, plate	22.00 to 23.00
No. 1 cupola cast.	32.00
Heavy breakable cast.	23.00
Stove plate	28.00
Automotive cast.	36.00

St. Louis

No. 1 hvy. melting	$25.00 to $26.00
No. 2 hvy. melting	23.50 to 24.50
No. 1 bundles	25.00 to 26.00
No. 2 bundles	19.50 to 20.50
Machine shop turn.	12.50 to 13.00
Cast iron borings	13.00 to 14.00
Shoveling turnings	14.00 to 15.00
No. 1 RR. hvy. melting	29.00 to 30.00
Rails, random lengths	34.00 to 35.00
Rails, 18 in. and under	41.00 to 42.00
Locomotive tires, uncut	30.00 to 31.00
Angles and splice bars	30.00 to 31.00
Std. steel car axles	35.00 to 36.00
RR. spring steel	30.00 to 31.00
Cupola cast.	40.00 to 41.00
Hvy. breakable cast.	29.00 to 30.00
Cast iron brake shoes	25.00 to 26.00
Stove plate	34.00 to 35.00
Cast iron car wheels	30.00 to 31.00
Malleable	35.00 to 36.00
Unstripped motor blocks.	29.00 to 30.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$20.50 to $21.50
No. 2 hvy. melting	17.50 to 18.50
No. 2 bundles	15.00 to 16.00
Machine shop turn.	5.00 to 6.00
Mixed bor. and turn.	7.00 to 8.00
Shoveling turnings	8.00 to 9.00
Clean cast chem. borings.	14.00 to 15.00
No. 1 machinery cast.	35.00 to 36.00
Mixed yard cast.	29.00 to 30.00
Charging box cast.	29.00 to 30.00
Heavy breakable cast.	27.00 to 28.00
Unstripped motor blocks.	22.00 to 23.00

Birmingham

No. 1 hvy. melting	$20.50
No. 2 hvy. melting	19.50
No. 1 bundles	20.00
No. 2 bundles	$15.00 to 16.00
No. 1 busheling	20.50
Machine shop turn.	15.00 to 16.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	15.00 to 16.00
Electric furnace bundles	26.00 to 27.00
Bar crops and plate	29.00 to 30.00
Structural and plate, 2 ft	29.00 to 30.00
No. 1 RR. hvy. melting	26.00 to 27.00
Scrap rails, random lgth.	34.00 to 35.00
Rails, 18 in. and under	37.50 to 38.50
Angles & splice bars	35.00 to 36.00
Rerolling rails	39.50 to 40.00
No. 1 cupola cast.	43.50 to 44.50
Stove plate	40.50 to 41.50
Charging box cast.	19.00 to 20.00
Cast iron car wheels	33.00 to 34.00
Unstripped motor blocks.	34.50 to 35.50
Mashed tin cans	15.00 to 16.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$18.00 to $19.00
No. 2 hvy. melting	14.25 to 15.25
No. 1 bundles	18.00 to 19.00
No. 2 bundles	14.00 to 15.00
No. 1 busheling	18.00 to 19.00
Elec. furnace, 3 ft & under	18.00 to 19.00
Machine shop turn.	4.00 to 5.00
Mixed bor. and short turn.	8.00 to 9.00
Shoveling turnings	10.00 to 11.00
Clean cast chem. borings.	11.00 to 12.00
No. 1 machinery cast.	29.00 to 30.00
Mixed cupola cast.	26.00 to 27.00
Heavy breakable cast.	25.00 to 25.50
Stove plate	25.00 to 26.00
Unstripped motor blocks.	15.50 to 16.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$25.50 to $26.50
No. 2 hvy. melting	22.50 to 23.50
No. 1 bundles	26.00 to 27.00
No. 2 bundles	21.00 to 22.00
Machine shop turn.	11.00 to 13.00
Mixed bor. and turn.	13.50 to 14.50
Shoveling turnings	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Low phos., 18 in. & under	32.00 to 33.00
Rails, random lengths	35.00 to 36.00
Rails, 18 in. and under	43.00 to 44.00
No. 1 cupola cast.	38.00 to 39.00
Hvy. breakable cast.	34.00 to 35.00
Drop broken cast.	43.00 to 44.00

San Francisco

No. 1 hvy. melting	$20.00
No. 2 hvy. melting	16.00
No. 1 bundles	19.00
No. 2 bundles	16.00
No. 3 bundles	12.00
Machine shop turn.	5.00
Cast iron borings	8.00
No. 1 RR. hvy. melting	20.00
No. 1 cupola cast.	$42.00 to 45.00

Los Angeles

No. 1 hvy. melting	$20.00
No. 2 hvy. melting	16.00
No. 1 bundles	19.00
No. 2 bundles	$15.50 to 16.00
No. 3 bundles	12.00
Machine shop turn.	5.00
Shoveling turnings	7.00 to 9.00
Cast iron borings	7.00 to 9.00
Elec. fur. 1 ft and under	25.00
No. 1 RR. hvy. melting	20.00
No. 1 cupola cast.	42.00 to 43.00

Seattle

No. 1 hvy. melting	$25.00
No. 2 hvy. melting	21.00
No. 1 bundles	21.50
No. 2 bundles	17.00
No. 3 bundles	13.00
No. 1 cupola cast.	35.00
Mixed yard cast.	35.00

Hamilton, Ont.

No. 1 hvy. melting	$22.00
No. 2 hvy. melting	19.00
No. 1 bundles	22.00
No. 2 bundles	19.00
Mixed steel scrap	16.00
Bushelings	17.00
Bush., new fact prep'd	20.00
Bush., new fact unprep'd	16.00
Short steel turnings	12.00
Mixed bor. and turn.	13.00
Rails, remelting	31.00
Cast scrap	$42.00 to 45.00

horsepower...

One of the aids to the development of nineteenth-century horse power was the invention of a machine-made horse shoe—patented by Henry Burden, of Troy, New York, in 1835.

For 1953's vast power needs, horse shoes will not suffice. Motors, machines and engines of iron and steel have to be maintained, replaced, and increased in number, to meet the ever-growing power load demanded by commerce, industry, agriculture and armament..... The supply of scrap must continuously keep pace with the insistent needs for steel.

For the purchase or sale of iron or steel scrap . . .

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Comparison of Prices

(Effective Aug. 17, 1954)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Aug. 17 1954	Aug. 10 1954	July 20 1954	Aug. 18 1953
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.05¢	4.05¢	4.05¢	3.925¢
Cold-rolled sheets	4.95	4.95	4.95	4.775
Galvanized sheets (10 ga.)	5.45	5.45	5.45	5.275
Hot-rolled strip	4.05	4.05	4.05	3.925
Cold-rolled strip	5.82	5.82	5.82	5.575
Plate	4.237	4.237	4.237	4.10
Plates wrought iron	9.30	9.30	9.30	9.00
Stainl's C-R strip (No. 302)	41.50	41.50	41.50	41.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) coke	$8.95	$8.95	$8.95	$8.95
Tinplate, electro (0.50 lb.)	7.65	7.65	7.65	7.65
Special coated mfg. ternes	7.75	7.75	7.75	7.75
Bars and Shapes. (per pound)				
Merchant bars	4.312¢	4.312¢	4.312¢	4.15¢
Cold-finished bars	5.40	5.40	5.40	5.20
Alloy bars	5.075	5.075	5.075	4.875
Structural shapes	4.25	4.25	4.25	4.10
Stainless bars (No. 302)	35.50	35.50	35.50	35.50
Wrought iron bars	10.40	10.40	10.40	10.05
Wire: (per pound)				
Bright wire	5.75¢	5.75¢	5.75¢	5.525¢
Rails: (per 100 lb.)				
Heavy rails	$4.45	$4.45	$4.45	$4.325
Light rails	5.35	5.35	5.35	5.20
Semifinished Steel: (per net ton)				
Rerolling billets	$64.00	$64.00	$64.00	$62.00
Slabs, rerolling	64.00	64.00	64.00	62.00
Forging billets	78.00	78.00	78.00	75.50
Alloy blooms, billets, slabs	86.00	86.00	86.00	82.00
Wire Rod and Skelp: (per pound)				
Wire rods	4.675¢	4.675¢	4.675¢	4.525¢
Skelp	3.90	3.90	3.90	3.75
Finished Steel Composite: (per pound)				
Base price	4.301¢	4.301¢	4.301¢	4.634¢

	Aug. 17 1954	Aug. 10 1954	July 20 1954	Aug. 18 1953
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$61.19	$61.19	$61.19	$62.19
Foundry, Valley	56.50	56.50	56.50	58.50
Foundry, Southern, Cin'ti	60.43	60.43	60.43	60.43
Foundry, Birmingham	52.88	52.88	52.88	53.88
Foundry, Chicago	56.50	56.50	56.50	58.50
Basic del'd. Philadelphia	60.27	60.27	60.27	61.27
Basic, Valley furnace	56.00	56.00	56.00	58.00
Malleable, Chicago	56.50	56.50	56.50	58.50
Malleable, Valley	56.50	56.50	56.50	58.50
Ferromanganese‡, cents per lb.	10.00¢	10.00¢	10.00¢	10.00¢
‡ 76 pct Mn base.				
Pig Iron Composite: (per gross ton)				
Pig iron	$56.59	$56.59	$56.59	$58.76
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$29.50	$29.50	$28.50	$45.50
No. 1 steel, Phila. area	27.00	24.50	23.50	42.50
No. 1 steel, Chicago	29.50	29.50	28.50	42.50
No. 1 bundles, Detroit	23.50	23.50	22.00	40.50
Low phos., Youngstown	*31.00*	33.00	30.50	48.50
No. 1 mach'y cast, Pittsburgh	42.50	42.50	42.50	49.50
No. 1 mach'y cast, Philadel'a.	40.50	39.50	39.50	45.50
No. 1 mach'y cast, Chicago	39.50	39.50	39.50	45.00
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	$28.67	$27.83	$26.83	$43.17
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.38	$14.38	$14.38	$14.75
Foundry coke, prompt	16.75	16.75	16.75	17.25
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	30.00	30.00	30.00	29.25‡
Copper, Lake, Conn.	30.00	30.00	30.00	30.125
Tin, Straits, New York	*93.125*†	93.375*	96.625	83.00
Zinc, East St. Louis	11.00	11.00	11.00	11.00
Lead, St. Louis	13.80	13.80	13.80	13.80
Aluminum, virgin ingot	22.20	22.20	21.50	21.50
Nickel, electrolytic	63.08	63.08	63.08	63.08
Magnesium, ingot	27.75	27.75	27.75	27.00
Antimony, Laredo, Tex.	28.50	28.50	28.50	34.50

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

← To identify producers, see Key on P. 191 →

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem *B3*	58.00	58.50	59.00	59.50	.....
Birmingham *R3*	52.38	52.88	.....	.....	.....
Birmingham *W9*	52.38	52.88	.....	.....	.....
Birmingham *U4*	52.38	52.88	56.50	.....	.....
Buffalo *R3*	56.00	56.50	57.00	.....	.....
Buffalo *H1*	56.00	56.50	57.00	.....	.....
Buffalo *W6*	56.00	56.50	57.00	.....	.....
Chicago *I4*	56.00	56.50	56.50	57.00	.....
Cleveland *A5*	56.00	56.50	56.50	57.00	61.00
Cleveland *R3*	56.00	56.50	56.50	.....	.....
Daingerfield *L3*	52.50	52.50	52.50	.....	.....
Duluth *I4*	56.00	56.50	56.50	57.00	.....
Erie *I4*	56.00	56.50	56.50	57.00	.....
Everett *M6*	.....	61.00	61.50	.....	.....
Fontana *K1*	62.00	62.50	.....	.....	.....
Geneva, Utah *C7*	56.00	56.50	.....	.....	.....
Granite City *G2*	57.90	58.40	58.90	.....	.....
Hubbard *Y1*	.....	.....	56.50	.....	.....
Minnequa *C6*	58.00	59.00	59.00	.....	.....
Monessen *P6*	56.00	.....	.....	.....	.....
Neville Isl. *P4*	56.00	56.50	56.50	.....	.....
Pittsburgh *U1*	56.00	.....	.....	57.00	.....
Sharpsville *S3*	56.00	56.50	56.50	57.00	.....
Steelton *B3*	58.00	58.50	59.00	59.50	64.00
Swedeland *A2*	58.00	58.50	59.00	59.50	.....
Toledo *I4*	56.00	56.50	56.50	57.00	.....
Troy, N. Y. *R3*	58.00	58.50	59.00	59.50	64.00
Youngstown *Y1*	.....	.....	56.50	57.00	.....
N. Tonawanda *T1*	.....	56.50	57.00	.....	.....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.50 pct manganese over 1 pct., $2 per ton for .05 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 and over.

Silvery Iron: Buffalo, *H1*, $68.25; Jackson, *J1, G1*, $67.00. Add $1.50 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add $1 per ton for 0.75 pct. or more phosphorus. Add 75¢ for each 0.50 pct. manganese over 1.0 pct. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	16.25	17.25	18.75	18.25	28.00	22.75	24.50	14.00	.....	14.25
Slabs, billets, rerolling	20.50	22.75	24.75	23.75	36.25	29.50	32.25	18.25	.....	18.50
Forg. discs, die blocks, rings	38.50	38.50	41.50	40.50	60.00	45.50	50.75	31.00	31.75	31.75
Billets, forging	29.50	29.75	32.25	31.00	46.50	35.25	39.50	24.00	24.50	24.50
Bars, wires, structurals	35.25	35.50	38.25	37.25	55.50	42.00	46.75	28.75	29.25	29.25
Plates	37.25	37.50	39.75	39.75	58.75	45.75	51.25	30.00	30.50	30.50
Sheets	41.25	41.50	48.75	43.75	62.75	50.50	59.25	34.25	41.25	34.75
Strip, hot-rolled	29.75	32.00	36.75	34.25	53.25	41.00	46.50	26.25	.....	27.00
Strip, cold-rolled	38.25	41.50	45.50	43.75	62.75-63.00	50.50-50.75	59.25	34.25	41.25	34.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; McKeesport, Pa., *U1*; Washington, Pa., *W2, J1*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Ft. Wayne, *J4*.

Strip: Midland, Pa., *C11*; Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Middletown, O., *A7*; Harrison, N. J., *D3*; Youngstown, *C5*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (.25¢ per lb higher) *W1* (.25¢ per lb higher); New Bedford, Mass., *R6*.

Bar: Baltimore, *A7*; Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1, F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*; Ft. Wayne, *I4*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*.

Forged discs, die blocks, rings: Pittsburgh, *C11*; Syracuse, *C11*; Ferndale, Mich., *A3*; Washington, Pa., *J2*.

Forging billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*.

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IRON AGE

STEEL PRICES

(Effective Aug. 17, 1954)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$86.00 *B3*		4.30 *B3*	6.45 *B3*	4.30 *B3*						
	Buffalo, N. Y.	$64.00 *B3*	$78.00 *B3, R3*	$86.00 *B3, R3*	5.075 *B3*	4.30 *B3*	6.45 *B3*	4.30 *B3*	4.05 *B3,R3*	5.75 *B3,R7*	6.15 *B3*	8.425 *B3*		
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.								4.175 *A2*		6.15 *A2*			
	New Bedford, Mass.									6.20 *R6*				
	Harrison, N. J.													
	Johnstown, Pa.	$64.00 *B3*	$78.00 *B3*	$86.00 *B3*		4.30 *B3*	6.45 *B3*		4.05 *B3*					
	Fairless, Pa.													
	New Haven, Conn.									6.20 *D1* 6.50 *A5*				
	Phoenixville, Pa.					3.95 *P2*		3.95 *P2*						
	Sparrows Pt., Md.								4.05 *B3*	5.75 *B3*	6.15 *B3*	8.425 *B3*		
	Wallingford, Conn.									6.20 *W1*				
	Worcester, Mass. Pawtucket, R. I.									6.30 *N7* 6.60 *A5*				12.75 *A5* 12.30 *N7*
MIDDLE WEST	Alton, Ill.								4.225 *L1*					
	Ashland, Ky.								4.05 *A7*					
	Canton-Massillon, Dover, Ohio			$82.00 *T5* $86.00 *R3*										12.45 *G*
	Chicago, Ill.	$64.00 *U1*	$78.00 *R3, U1,W8*	$86.00 *U1, W8,R3*	5.075 *U1*	4.25 *U1, W8*	6.40 *U1, Y1*	4.25 *U1*	4.05 *A1, N4, W8*	5.85 *A1*				
	Cleveland, Ohio		$78.00 *R3*							5.75 *A5, J3*		8.60 *A5*		12.45 *A5*
	Detroit, Mich.			$88.00 *R5*					4.20 *G3,M2*	5.90 *D1, D2, G3, M2, P11*	6.30 *G3*	8.35 *D2* 8.75 *G3*		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$64.00 *U1*	$78.00 *U1*	$86.00 *U1, Y1*	5.075 *I3*	4.25 *I3, U1*	6.40 *U1, I3*		4.05 *I3, U1, Y1*	6.00 *I3*	6.15 *U1, I3, Y1*	8.60 *Y1*	6.70 *U1, Y1*	
	Sterling, Ill.								4.15 *N4*					
	Indianapolis, Ind.									5.90 *C5*				
	Newport, Ky.												6.70 *N5*	
	Middletown, Ohio									5.75 *A7*				
	Niles, Warren, Ohio Sharon, Pa.								4.05 *S1, R3*	5.75 *S1, R3, T4*	6.15 *S1, R3*	8.60 *S1, R3*	6.70 *S1*	12.45 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	$64.00 *U1, J3*	$78.00 *J3, U1, C11*	$86.00 *U1, C11*	5.075 *U1*	4.25 *J3, U1*	6.40 *J3, U1*	4.25 *U1*	4.05 *S7, P6*	5.75 *B4, J3, S7*			6.70 *S9*	12.45 *S9*
	Portsmouth, Ohio								4.05 *P7*	5.75 *P7*				
	Weirton, Wheeling, Follansbee, W. Va.					4.25 *W3*			4.05 *W3*	5.75 *F3, W3*	6.15 *W3*	8.60 *W3*		
	Youngstown, Ohio		$78.00 *C10*	$86.00 *Y1, C10*		4.25 *Y1*	6.40 *Y1*		4.05 *U1, Y1*	5.75 *Y1, C5*	6.15 *U1, Y1*	8.60 *Y1*	6.70 *U1, Y1*	12.45 *C5*
WEST	Fontana, Cal.	$72.00 *K1*	$86.00 *K1*	$105.00 *K1*		4.90 *K1*	7.05 *K1*	5.25 *K1*	4.825 *K1*	7.65 *K1*	7.25 *K1*		8.10 *K1*	14.95 *K1*
	Geneva, Utah		$78.00 *C7*			4.25 *C7*	6.40 *C7*							
	Kansas City, Mo.					4.85 *S2*	7.00 *S2*		4.65 *S2*				7.30 *S2*	
	Los Angeles, Torrance, Cal.		$87.50 *B2*	$106.00 *B2*		4.95 *B2, C7*	7.10 *B2*		4.80 *B2,C7*	7.80 *C1*				
	Minnequa, Colo.					4.70 *C6*			5.15 *C6*					
	San Francisco, Niles, Pittsburg, Cal.		$87.50 *B2*			4.90 *B2* 4.95 *P9*	7.05 *B2*		4.80 *B2,C7*					
	Seattle, Wash.		$91.50 *B2*			5.00 *B2*	7.15 *B2*		5.05 *B2, P12*					
SOUTH	Atlanta, Ga.								4.25 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$64.00 *T2*	$78.00 *T2*			4.25 *T2,C16* 4.28 *R5*	6.40 *T2*		4.05 *R3, T2,C16*		6.15 *T2*			
	Houston, Tex.		$85.00 *S2*	$93.00 *S2*		4.65 *S2*	6.85 *S2*		4.45 *S2*				7.10 *S2*	

STEEL PRICES

(Effective Aug. 17, 1954)

Italics identify producers listed in key at end of table. Base prices, f.o.b., mill in cents per lb., unless otherwise noted. Extras apply.

		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized 10 ga.	Enameling 12 ga.	Long Terne 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Coke* 1.25-lb. base box	Electro* 0.25-lb. base box	Holloware Enameling 29 ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.05 *B3*	4.95 *B3*				6.10 *B3*	7.50 *B3*			4.675 *W6*			
	Claymont, Del.											† Special coated mfg. terne deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate 55 to 128 lb deduct $2.20 from 1.25-lb coke base box. * COKES: 1.50 lb add 25¢. ELECTRO: 0.50-lb add 25¢; 0.75-lb add 65¢; 1.00-lb add $1.30.		
	Coatesville, Pa.													
	Conshohocken, Pa.	4.10 *A2*					6.10 *A2*							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										4.675 *B3*			
	Fairless, Pa.	4.10 *U1*	5.00 *U1*				6.15 *U1*	7.55 *U1*				$8.80 *U1*	$7.50 *U1*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.05 *B3*	4.95 *B3*	5.45 *B3*			6.10 *B3*	7.50 *B3*	8.20 *B3*		4.775 *B3*	$8.80 *B3*	$7.50 *B3*	
	Worcester, Mass.										4.975 *A5*			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										4.85 *L1*			
	Ashland, Ky.	4.05 *A7*		5.45 *A7*	5.375 *A7*									
	Canton-Massillon, Dover, Ohio			5.45 *R1,R3*						5.175 *R1*				
	Chicago, Joliet, Ill.	4.05 *A1, W8*					6.10 *U1*				4.675 *A5, N4,R3*			
	Sterling, Ill.										4.775 *N4*			
	Cleveland, Ohio	4.05 *J3, R3*	4.95 *J3, R3*		5.375 *R3*		6.10 *J3, R3*	7.50 *J3, R3*			4.675 *A5*			
	Detroit, Mich.	4.20 *G3, M2*	5.10 *G3*				6.25 *G3*	7.65 *G3*						
	Newport, Ky.	4.05 *N5*		5.45 *N5*										
	Gary, Ind. Harbor, Indiana	4.05 *I3, U1, Y1*	4.95 *I3, U1, Y1*	5.45 *U1, I3*	5.375 *I3, U1*	5.85 *U1*	6.10 *U1, I3, Y1*	7.50 *U1, Y1*			4.675 *Y1*	$8.70 *I3, U1, Y1*	$7.40 *I3, U1, Y1*	6.10 *U1, Y1*
	Granite City, Ill.	4.25 *G2*	5.15 *G2*	5.65 *G2*	5.575 *G2*								$7.60 *G2*	6.30 *G2*
	Kokomo, Ind.	4.15 *C9*		5.55 *C9*						5.20 *C9*	4.775 *C9*			
	Mansfield, Ohio					5.85 *E2*				5.175 *E2*				
	Middletown, Ohio		4.95 *A7*		5.375 *A7*	5.85 *A7*								
	Niles, Ohio Sharon, Pa.	4.05 *S1,R3* 5.30 *N3*	4.95 *R3* 5.975 *N3*	5.45 *N3*	6.725 *N3*	5.85 *N3*	6.10 *S1,R3*	7.50 *R3*				$8.70 *R3*	$7.40 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.05 *J3, U1,P6*	4.95 *J3, U1,P6*	5.45 *U1*	5.375 *U1*		6.10 *J3, U1*	7.50 *J3, U1*	8.20 *U1*		4.675 *A5* 4.875 *P6*	$8.70 *J3, U1*	$7.40 *J3, U1*	6.10 *U1*
	Portsmouth, Ohio	4.05 *P7*	4.95 *P7*								4.675 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.05 *W3, W5*	4.95 *W3, W5,F3*	5.45 *W3, W5*		5.85 *W3, W5*	6.10 *W3*	7.50 *W3*				$8.70 *W3, W5*	$7.40 *W3, W5*	6.10 *F3, W5*
	Youngstown, Ohio	4.05 *U1, Y1*	4.95 *Y1*		5.375 *Y1*		6.10 *U1, Y1*	7.50 *Y1*			4.675 *Y1*			
WEST	Fontana, Cal.	4.825 *K1*	6.05 *K1*				6.875 *K1*	8.55 *K1*			5.475 *K1*			
	Geneva, Utah	4.15 *C7*					6.45 *C7*							
	Kansas City, Mo.													
	Los Angeles, Torrance, Cal.										5.475 *C7, B2*			
	Minnequa, Colo.										4.925 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	4.75 *C7*	5.90 *C7*	6.20 *C7*							5.325 *C7*	$9.45 *C7*	$8.15 *C7*	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.05 *R3, T2*	4.95 *T2*	5.45 *R3, T2*			6.10 *T2*			5.35 *R3*	4.675 *T2, R3*	$8.80 *T2*	$7.50 *T2*	
	Houston, Texas	4.45 *S2*									5.075 *S2*			

IRON AGE

STEEL PRICES

(Effective Aug. 17, 1954)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfg'rs. Bright
EAST	Bethlehem, Pa.				5.075 *B3*	6.625 *B3*	6.45 *B3*					
	Buffalo, N. Y.	4.30 *B3* 4.33 *R3*	4.30 *B3* 4.33 *R3*	5.45 *B5*	5.075 *B3* 5.105 *R3*	6.625 *B3,B5*	6.45 *B3*	4.225 *B3*			6.45 *B3*	5.75 *W6*
	Claymont, Del.							4.225 *C4*		5.80 *C4*		
	Coatesville, Pa.							4.225 *L4*		5.80 *L4*		
	Conshohocken, Pa.							4.225 *A2*	5.275 *A2*		6.45 *A2*	
	Harrisburg, Pa.							3.975C3	5.275C3			
	Hartford, Conn.			5.90 *R3*		6.925 *R3*						
	Johnstown, Pa.	4.30 *B3*	4.30 *B3*		5.075 *B3*		6.45 *B3*	4.225 *B3*		5.80 *B3*	6.45 *B3*	5.75 *B3*
	Fairless, Pa.	4.45 *U1*	4.45 *U1*		5.225 *U1*							
	Newark, N. J.			5.85 *W10*		6.80 *W10*						
	Camden, N. J.			5.85 *P10*								
	Putnam, Conn.			5.95 *W10*								
	Sparrows Pt., Md.		4.30 *B3*					4.225 *B3*		5.80 *B3*	6.45 *B3*	5.85 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			5.85*W11* 5.95*B5, C14*		6.925 *A5* 7.075 *B5*						6.85 *A5, W6*
MIDDLE WEST	Alton, Ill.	4.50 *L1*										5.925 *L1*
	Ashland, Newport, Ky.							4.225 *A7, N5*		5.80 *N5*		
	Canton-Massillon, Mansfield, Ohio			5.40 *R3* 5.44 *R3*	4.875 *T5* 5.115 *R3*	6.325 *T5* 6.625 *R2* 6.665 *R3*		4.225 *E2*				
	Chicago, Joliet, Ill.	4.30 *U1, N4,W8* 4.37 *R3*	4.30 *N4* 4.37 *R3*	5.40 *A5,W10, W8,B5,L2*	5.075 *U1, W8* 5.145 *R3*	6.625 *A5,W8, W10,L2, B5*		4.225 *U1,W8, I3, A1*	5.275 *U1*	5.80 *U1*	6.45 *U1*	5.75 *A5, R3,N4, W7*
	Cleveland, Ohio	4.36 *R3*	4.36 *R3*	5.40 *A5,C13*		6.625 *A5* 6.665 *C13*		4.225 *J3* 4.285 *R3*	5.275 *J3*		6.45 *J3*	5.75 *A5, C13*
	Detroit, Mich.	4.45 *R5,G3*		5.55 *R5* 5.60 *B5,P8* 5.65 *P3*	5.175 *R5* 5.225 *G3*	6.725 *R5* 6.825 *B5,P3, P8*	6.60 *G3*	4.375 *G3*			6.60 *G3*	
	Duluth, Minn.											5.75 *A5*
	Gary, Ind. Harbor, Crawfordsville	4.30 *I3, U1, Y1*	4.30 *I3, U1, Y1*	5.40 *M5* 5.45 *R3*	5.075 *I3, U1, Y1*	6.525 *M5* 6.695 *R3*	6.45 *U1,I3, Y1*	4.225 *I3, U1,Y1*	5.275 *I3*	5.80 *U1, Y1*	6.45 *U1,I3, Y1*	5.85 *M4*
	Granite City, Ill.							4.425 *G2*				
	Kokomo, Ind.											5.85*C9*
	Sterling, Ill.	4.40 *N4*	4.40 *N4*									5.85 *N4*
	Niles, Ohio Sharon, Pa.	4.34 *R3*						4.225 *S1*		5.80 *S1*	6.45 *S1*	
	Pittsburgh, Pa. Midland, Pa.	4.30 *J3, U1, C11*	4.30 *J3, U1*	5.40*A5,C8,C11 J3,W10,B4* 5.46 *R3*	5.075 *U1,C11,*	6.625 *A5,C11, W10,C8* 6.685 *R3*	6.45 *J3, U1*	4.225 *J3, U1*	5.275 *U1*	5.80 *U1*	6.45 *J3, U1*	5.75 *A5,J3, P6*
	Portsmouth, Ohio											5.75 *P7*
	Weirton, Wheeling, Follansbee, W. Va.	4.30 *W3*						4.225 *W3, W5*				
	Youngstown, Ohio	4.30 *U1 Y1 C10* 4.35 *R3*	4.30 *U1, Y1* 4.35 *R3*	5.40 *F2, Y1, C10*	5.075 *U1, Y1, C10*	6.625 *Y1, C10* 6.665 *F2*	6.45 *U1, Y1*	4.225 *U1, Y1*		5.80 *Y1*	6.45 *Y1*	5.75 *Y1*
WEST	Emeryville, Cal.	5.05 *J5*	5.05 *J5*									
	Fontana, Cal.	5.00 *K1*	5.00 *K1*		6.125 *K1*		7.70 *K1*	4.875 *K1*		6.45 *K1*	7.15 *K1*	
	Geneva, Utah							4.225 *C7*			6.45 *C7*	
	Kansas City, Mo.	4.90 *S2*	4.90 *S2*		5.675 *S2*		7.05 *S2*					6.35 *S2*
	Los Angeles, Torrance, Cal.	5.00 *B2,C7*	5.00 *B2,C7*	6.85 *R3* 7.16 *R3*	6.125 *B2*		7.15 *B2*					6.70 *B2*
	Minnequa, Colo.	4.75 *C6*	4.75 *C6*					5.075 *C6*				5.90 *C6*
	Portland, Ore.	4.90 *O2*										
	San Francisco, Niles, Pittsburg, Cal.	5.00 *C7,P9* 5.05 *B2*	5.00 *C7,P9* 5.05 *B2*				7.20 *B2*					6.70 *C7*
	Seattle, Wash.	5.05 *B2, P12, N6*	5.05 *B2, P12*				7.20 *B2*	5.125 *B2*		6.70 *B2*	7.35 *B2*	
SOUTH	Atlanta, Ga.	4.50 *A8*	4.50 *A8*									5.95 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	4.30 *T2,C16* 4.33 *R3*	4.30 *T2, C16* 4.33 *R3*				6.45 *T2*	4.225 *T2* 4.255 *R3*			6.45 *T2*	5.75 *R3, T2*
	Houston, Ft. Worth, Lone Star, Tex.	4.70 *S2*	4.70 *S2*		5.475 *S2*		6.85 *S2*	4.40 *L3* 4.625 *S2*		6.20 *S2*	6.85 *S2*	6.25 *S2*

Steel Prices

(Effective Aug. 17, 1954)

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metal Products Co., Youngstown, O.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, New York
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Co., Inc., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N5 Newport Steel Corp., Newport, Ky.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P12 Pacific Steel Rolling Mills, Seattle

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.
T7 Texas Steel Co., Fort Worth

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wycoff Steel Co., Pittsburgh
W11 Worcester Pressed Steel Co., Worcester, Mass.

Y1 Youngstown Sheet & Tube Co., Youngstown

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
STANDARD T. & C.																						
Sparrows Pt. *B3*	21.75	6.5	24.75	10.5	27.25	14.0	29.75	14.75	30.25	15.75	30.75	16.25	32.25	16.0	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *R3*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Fontana *K1*	10.75	+4.5	13.75	+0.5	16.25	3.0	18.75	3.75	19.25	4.75	19.75	5.25	21.25	5.0	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	+1.50	17.5	0.75	20.0	3.25	21.5	4.75
Alton, Ill. *L1*	21.75	6.5	24.75	10.5	27.25	14.0	29.75	14.75	30.25	15.75	30.75	16.25	32.25	16.0	.....	.....	.....	.....	.....	.....	.....	.....
Sharon *M3*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Fairless *N2*	21.75	6.5	24.75	10.5	27.25	14.0	29.75	14.75	30.25	15.75	30.75	16.25	32.25	16.0	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	+1.50	17.5	0.75	20.0	3.25	21.5	4.75
Wheeling *W5*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Wheatland *W4*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	+1.50	17.5	0.75	20.0	3.25	21.5	4.75
Indiana Harbor *Y1*	22.75	7.5	25.75	11.5	28.25	15.0	30.75	15.75	31.25	16.75	31.75	17.25	33.25	17.0	.....	.....	.....	.....	.....	.....	.....	.....
Lorain *N2*	23.75	8.5	26.75	12.5	29.25	16.0	31.75	16.75	32.25	17.75	32.75	18.25	34.25	18.0	13.5	+1.50	17.5	0.75	20.0	3.25	21.5	4.75
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	25.25	11.5	29.25	15.5	31.25	19.0	31.75	17.75	32.25	18.75	32.75	19.25	33.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *R3*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0	.....	.....	.....	.....	.....	.....	.....	.....
Fairless *N2*	25.25	11.5	29.25	15.5	31.25	19.0	31.75	17.75	32.25	18.75	32.75	19.25	33.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Fontana *K1*	14.25	.....	18.25	.....	20.25	.....	20.75	.....	21.25	.....	21.75	.....	22.25	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.25	35.25	20.0	14.0	.....	19.0	3.25	21.5	5.75	26.5	10.75
Alton, Ill. *L1*	25.25	11.5	29.25	15.5	31.25	19.0	31.75	17.75	32.25	18.25	32.75	19.25	33.25	18.0	.....	.....	.....	.....	.....	.....	.....	.....
Sharon *M3*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	14.0	.....	19.0	3.25	21.5	5.75	26.5	10.75
Wheeling *W5*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	.....	.....	.....	.....	.....	.....	.....	.....
Wheatland, *W4*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	14.0	.....	19.0	3.25	21.5	5.75	26.5	10.75
Indiana Harbor *Y1*	26.25	12.5	30.25	16.5	32.25	20.0	32.75	18.75	33.25	19.75	33.75	20.75	34.25	19.0	.....	.....	.....	.....	.....	.....	.....	.....
Lorain *N2*	27.25	13.5	31.25	17.5	33.25	21.0	33.75	19.75	34.25	20.75	34.75	21.75	35.25	20.0	14.0	.....	19.0	3.25	21.5	5.75	26.5	10.75

Threads only, buttweld and seamless 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 4½ pt. higher discount. Buttweld jobbers' discount, 5 pct.
Galvanized discounts based on zinc price in range of over 9¢ to 11¢ incl. per lb, East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt. e.g., zinc price in range of over 11¢ to 13¢ would lower discounts; zinc price in range of over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.00¢ per lb.

Steel Prices

(Effective Aug. 17, 1954)

To identify producers, see Key on preceding page

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer *U1*	4.45	5.35	5.425	.....	.....	.....	.....
So. Chicago *R3*	.....	.....	.....	7.30	.....	.....	.....
Ensley *T2*	4.45	5.35	.....	.....	.....	.....	.....
Fairfield *T2*	.....	5.35	.....	7.30	.....	5.275	.....
Gary *U1*	4.45	5.35	.....	.....	.....	5.275	.....
Ind. Harbor *I3*	4.45	.....	5.425	7.30	.....	5.275	.....
Johnstown *B3*	.....	5.35	.....	.....	.....	.....	.....
Joliet *U1*	.....	5.35	5.425	.....	.....	.....	.....
Kansas City *S2*	.....	.....	.....	7.30	.....	.....	11.00
Lackawanna *B3*	4.45	5.35	5.425	.....	.....	5.275	.....
Minnequa *C6*	4.45	5.85	5.425	7.30	.....	5.275	11.50
Pittsburgh *O1*	.....	.....	.....	.....	11.00	.....	11.50
Pittsburgh *P5*	.....	.....	.....	.....	11.00	.....	11.50
Pittsburgh *J3*	.....	.....	.....	7.30	.....	.....	.....
Seattle *B2*	.....	.....	.....	7.80	.....	5.425	11.50
Steelton *B3*	4.45	.....	5.425	.....	.....	5.275	.....
Struthers *Y1*	.....	.....	.....	7.30	.....	.....	.....
Torrance *C7*	.....	.....	.....	.....	.....	5.425	.....
Williamsport *S5*	.....	5.35	.....	.....	.....	.....	.....
Youngstown *R3*	.....	.....	.....	7.30	.....	.....	.....

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	8.025	8.225	.....
Armature	8.50	8.75	9.25
Elect.	9.10	9.35	9.85
Motor	10.10	10.35	10.85
Dynamo	11.00	11.25	11.75
Trans. 72	11.95	12.20	12.70
Trans. 65	12.50	Grain Oriented	
Trans. 58	13.00	Trans. 80	16.60
Trans. 52	14.00	Trans. 73	17.10

Producing points: Beech Bottom (*W5*); Brackenridge (*A5*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville (*A7*).

* Coils 75¢ higher.

CLAD STEEL

	Plate	Sheet
Stainless-carbon		
No. 304, 20 pct.		
Coatesville, Pa., *L4*	*33.20	
Washington, Pa., *J2*	.....	
Claymont, Del., *C4*	.....	
New Castle, Ind., *I2*	.....	32.50
Nickel-carbon		
10 pct. Coatesville, Pa., *L4*	38.30	
Inconel-carbon		
10 pct., Coatesville, Pa., *L4*	46.90	
Monel-carbon		
10 pct. Coatesville, Pa., *L4*	39.70	

* Includes annealing and pickling, sandblasting.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence 9–15½ ga.	7'-7" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Ann'ld ¢/lb.	Merch. Wire* Galv. ¢/lb.
	Col	Col	Col	Col	Col		
Alabama City *R3*	137	146	...	155	150	6.90	7.30
Aliquippa, Pa. *J3*	137	149	...	...	156	6.90	7.425
Atlanta *A8*	139	151	...	157	164	7.00	7.525
Bartonville *K2*	139	151	...	157	164	7.00	7.55
Buffalo *W6*	.....	.....	.....	.....	.....	6.90	7.30
Chicago, Ill. *N4*	137	149	...	155	162	6.90	7.45
Cleveland *A6*	142	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	6.90	.....
Crawfordsville *M4*	139	151	...	157	159	7.00	7.55
Donora, Pa. *A5*	137	146	...	155	159	6.90	7.30
Duluth *A5*	137	146	150	155	159	6.90	7.30
Fairfield, Ala. *T2*	137	146	...	155	159	6.90	7.30
Galveston *D4*	139	.....	.....	.....	.....	.....	.....
Houston *S2*	145	154	...	...	167	7.30	7.70
Johnstown, Pa. *B3*	137	149	...	...	162	6.90	7.45
Joliet, Ill. *A5*	137	146	...	155	159	6.90	7.30
Kokomo, Ind. *C9*	139	148	...	157	161	7.00	7.35
Los Angeles *B2*	.....	.....	.....	.....	.....	7.85	.....
Kansas City *S2*	148	158	...	167	171	7.50	7.90
Minnequa *C6*	142	156	150	160	168	7.15	7.55
Monessen *P6*	137	151	...	...	163	6.90	7.45
Moline, Ill. *R3*	.....	.....	145	.....	.....	.....	.....
Pittsburg, Cal. *C7*	156	169	...	179	179	7.85	8.25
Portsmouth *P7*	.....	.....	.....	.....	.....	6.90	7.30
Rankin, Pa. *A5*	137	146	.....	.....	159	6.90	7.30
So. Chicago *R3*	137	146	145	155	159	6.90	7.30
S. San Francisco *C6*	.....	.....	.....	.....	179	.....	.....
Sparrows Pt. *B3*	130	.....	.....	157	164	7.00	7.55
Struthers, O. *Y1*	.....	.....	.....	.....	.....	6.90	7.55
Worcester *A5*	143	.....	.....	.....	.....	7.20	.....
Williamsport, Pa. *S5*	.....	.....	150	.....	.....	.....	.....

Cut Nails, carloads, base $8.30 per keg at Conshohocken, Pa. (*A2*).

* Alabama City and So. Chicago don't include zinc extra. Galvanized products computed with zinc at 11.0¢ per lb.

WAREHOUSES

Base price, f.o.b., dollars per 100 lb.

Cities	City Delivery Charge	Sheets: Hot-Rolled	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)	Strip: Hot-Rolled	Strip: Cold-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled	Bars: Cold-Finished	Alloy Bars: Hot-Rolled A 4615 As Rolled	Alloy Bars: Hot-Rolled A 4140 Annealed	Alloy Bars: Cold-Drawn A 4615 As Rolled	Alloy Bars: Cold-Drawn A 4140 Annealed
Baltimore	$.20	6.22	7.51	7.78	6.89	.....	6.57	6.92	6.88	8.52	.....	.....	.....	.....
Birmingham	.15	6.35–6.50	7.35–8.10	8.25–9.00	6.60	9.60	6.65	6.65	6.50	9.00	.....	.....	.....	.....
Boston	.10	7.23	8.23	9.42–9.52	7.47	9.65–9.85	7.34–7.37	7.49	7.20	8.60–8.70	12.60–12.80	12.45–12.46	15.15	15.10
Buffalo	.20	6.35–6.40	7.40[3]	8.80–8.58	6.70–6.75	.....	6.65–6.70	6.70–6.77	6.50–6.55	7.85[3]–7.90	12.50	12.15[3]	14.85	14.30–14.88[3]
Chicago	.20	6.38	7.38	8.30	6.62	.....	6.52	6.69	6.51	7.50	12.25	11.90	14.60	14.55
Cincinnati	.15	6.49–6.53	7.37–7.42	8.25–8.30	6.86–6.91	.....	6.81–6.86	6.91	6.75–6.80	7.80–7.85	12.55	12.15–12.20	14.90	14.80–14.85
Cleveland	.20	6.38	7.38	8.45	6.72	.....	6.69	7.02	6.57	7.60	11.96	.....	.....	14.61
Denver	.....	7.85	8.85	10.02	8.20	.....	7.95	7.95	8.05	9.05	.....	.....	.....	.....
Detroit	.20	6.57	7.57	8.50–8.58	6.90	.....	6.80–6.85	7.16	6.79	7.77	12.45	12.10	14.80	14.75
Houston	.20	7.35	7.65–7.80	9.93	7.70	.....	7.35	7.60	7.70	9.50–9.60	.....	13.10	.....	.....
Kansas City	.20	7.05	8.05	8.95	7.29	.....	7.19	7.36	7.18	8.07–8.27	.....	12.27	.....	.....
Los Angeles	.20	7.40	9.25	9.55–9.85	7.75	.....	7.35	7.55	7.35–7.45	10.05	.....	13.20	.....	16.35
Memphis	.10	6.79	7.69	.....	6.90	.....	7.01	7.09	6.88	8.24	.....	.....	.....	.....
Milwaukee	.20	6.47	7.47	8.21–8.39	6.71	.....	6.61	6.86	6.60	7.69	12.34	11.99	14.69	14.64–14.84
New Orleans	.15	6.70	7.65	9.23	6.80	.....	6.90–6.95	7.05	6.80	8.70–10.70	.....	.....	.....	.....
New York	.10	6.97–6.98	7.78–8.46	8.79[1]–8.99	7.36–7.56	.....	7.18–7.27	7.13–7.38	7.30–7.37	8.63–8.73[2]	12.63	12.28	.....	14.93
Norfolk	.20	7.00	.....	.....	7.10	.....	7.10	7.10	7.10	8.60	.....	.....	.....	.....
Philadelphia	.10	6.19	7.29[3]	8.09[4]–8.23	6.96	.....	6.49	6.54	6.74	8.19[3]	.....	11.66–11.96[3]	.....	14.61[3]
Pittsburgh	.20	6.38	7.38	8.30–8.50	6.72–6.75	.....	6.52	6.69	6.51	7.85	12.25	11.90	14.60	14.55
Portland	.20	7.60	8.75	9.05	7.85	.....	7.45	7.50	7.55	10.95	.....	.....	.....	.....
Salt Lake City	.20	7.65	10.20	10.70	9.05	.....	7.70	7.70–8.85	8.80	10.95	.....	.....	.....	.....
San Francisco	.20	7.55	8.95	9.35–9.85	7.80	.....	7.40	7.50	7.35	10.05	.....	13.20	.....	16.35
Seattle	.00	8.10	9.80	10.15	8.20	.....	7.80	7.75	7.80	10.95	.....	13.65	.....	16.30
St. Louis	.20	6.62–6.67	7.67	8.54–8.59	6.91	.....	6.81	7.09	6.80	7.89	12.54	12.19	14.84–14.89	14.45–14.84
St. Paul	.15	7.03	8.03–8.58	8.96	7.28	.....	7.19	7.35	7.16	8.26	.....	12.56	.....	15.21

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.

Exceptions: (1)1500 to 9999 lb. (2)1000 lb or over. (3)$.25 delivery. (4)1000 to 1999 lb, $.25 delivery.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Bridgeport, Conn. *S7**	5.75	8.05	9.00	11.15	13.85
Buffalo, N. Y. *R7*	5.75	8.05	9.00	10.95	13.25
Carnegie, Pa. *S9*	.....	8.05	9.00	11.15	13.85
Cleveland *A5*	5.75	8.05	9.00	11.15	13.85
Detroit *D1*	5.90	8.25	9.20	10.95	.....
Detroit *D2*	5.90	8.25	9.20	.....	.....
Harrison, N. J. *C11*	.....	.....	9.30	11.45	14.15
Indianapolis *C5*	5.75	8.05	9.00	10.95	.....
New Castle, Pa. *B4*	5.75	8.05	9.00	10.95	.....
New Haven, Conn. *D1*	6.20	8.35	9.30	11.25	.....
Pawtucket, R. I. *N7*	6.30	8.35	9.30	11.45	14.15
Riverdale, Ill. *A1*	5.85	8.05	9.00	11.15	13.85
Sharon, Pa. *S1*	5.75	8.05	9.00	11.15	13.85
Trenton *R4*	.....	8.35	9.30	11.25	13.40
Wallingford *W1*	6.20	8.35	9.30	11.45	14.15
Warren, Ohio *T4*	5.75	8.05	9.00	10.95	13.25
Weirton, W. Va. *W3*	5.85	8.05	9.00	10.95	13.25
Worcester, Mass. *A5*	6.60	8.35	9.30	11.45	14.15
Youngstown *C5*	5.75	8.05	9.00	10.95	.....

* Sold on Pittsburgh base.

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	28.33	33.97	26.51	31.91
	2½	12	38.15	45.74	35.70	43.07
	3	12	44.05	52.82	41.23	49.73
	3½	11	51.43	61.66	48.13	58.06
	4	10	68.29	81.28	63.92	77.10
National Tube	2	13	28.33	33.97	26.51	.....
	2½	12	38.15	45.74	35.70	.....
	3	12	44.05	52.82	41.23	.....
	3½	11	51.43	61.66	48.13	.....
	4	10	68.29	81.28	63.92	.....
Pittsburgh Steel	2	13	28.33	33.97	.....	.....
	2½	12	38.15	45.74	.....	.....
	3	12	44.05	52.82	.....	.....
	3½	11	51.43	61.66	.....	.....
	4	10	68.29	81.28	.....	.....

Miscellaneous Prices

(Effective Aug. 17, 1954)

TOOL STEEL

F.o.b. Mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.54
18	4	1	—	5	2.185
18	4	2	—	—	1.705
1.5	4	1.5	8	—	.90
6	4	2	6	—	1.39

High-carbon chromium ..... .73
Oil hardened manganese ..... .405
Special carbon ..... .37
Extra carbon ..... .31
Regular carbon ..... .26

Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.

CAST IRON WATER PIPE

	Per Net Ton
6 to 24-in., del'd Chicago	$111.80 to $115.30
6 to 24-in., del'd N. Y...	115.00 to 116.00
6 to 24-in., Birmingham	98.00 to 102.50

6-in. and larger f.o.b. cars, San Francisco, Los Angeles, for all rail shipments; rail and water shipments less .....$129.50 to $131.50

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices effective July 1, 1953, to end of 1954 season.

	Gross Ton
Openhearth lump	$11.15
Old range, bessemer	10.30
Old range, nonbessemer	10.15
Mesabi, bessemer	10.05
Mesabi, nonbessemer	9.90
High phosphorus	9.90

Prices based on upper Lakes rail freight rates, Lake vessel freight rates, handling and unloading charges, and taxes thereon, in effect on June 24, 1953. Increases or decreases after such date are for buyer's account.

COKE

Furnace, beehive (f.o.b. oven)	Net-Ton
Connellsville, Pa.	$14.25 to $14.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	$16.50 to $17.00
Foundry, oven coke	
Buffalo, del'd	$28.08
Chicago, f.o.b.	24.50
Detroit, f.o.b.	25.50
New England, del'd	26.05
Seaboard, N. J., f.o.b.	24.00
Philadelphia, f.o.b.	23.00
Swedeland, Pa., f.o.b.	23.00
Painesville, Ohio, f.o.b.	25.50
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.43
Cincinnati, del'd	26.56
St. Paul, f.o.b.	23.75
St. Louis, f.o.b.	26.00
Birmingham, f.o.b.	22.65
Lone Star, Tex., f.o.b.	18.50

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unboxed

GRAPHITE			CARBON		
Diam. (In.)	Length (In.)	Price	Diam. (In.)	Length (In.)	Price
24	84	20.50	40	100, 110	8.95
20	72	20.00	35	110	8.95
12 to 18	72	20.50	30	110	8.95
7 to 10	60	21.00	24	72 to 84	9.10
6	60	23.25	20	90	8.95
4	40	26.00	17	72	9.10
3	40	27.25	14	72	9.50
2½	30	28.00	10, 12	60	10.30
2	24	43.50	8	60	10.55

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolts

	Discount Less Case	Discount C.
½ in. & smaller x 4 in. & shorter	2	22
½ in. & smaller x 6 in. & shorter	+3	18
9/16 in. & ⅝ in. x 6 in. & shorter	+4	17
¾ in. & larger x 6 in. & shorter	+6	15
All diam. longer than 6 in.	+15	5
½ in. & smaller x 6 in. & shorter	+3	18
Lag, all diam. x 6 in. & shorter	6	25
Lag, all diam. longer than 6 in.	+2	19
Plow bolts	23	23

Stove Bolts

Packaged, package list ..... 44½—10
Bulk bulk list* 59

*Minimum quantity per item: 15,000 pieces lengths to 3"; 5,000 pieces lengths over 3". Special finishes: Zinc, Parkerized, cadmium or nickel add 6¢ per lb net. Black oil finish add 2¢ per lb net.

Nuts, H.P., C.P., reg. & hvy.

	Base Discount	Discount, Case or Keg
¾" or smaller	55	64
⅞" to 1½" inclusive ...	58	66
1¾" to 1½" inclusive ..	60	67½

C.P. Hex regular & hvy.

All sizes 55 64

Hot Galv. Nuts (all types)

¾" or smaller	38	50
⅞" to 1½" inclusive ...	41	52½

Finished, Semi-finished, Slotted or Castellated Nuts

All sizes 55 66

Rivets

	Base per 100 lb
½ in. & larger	$9.25
	Pct Off List
7/16 in. and smaller	37

Cap Screws

	Discount Bright	Discount H.C. Heat Treated
New std. hex head, packaged		
⅝" x 6" and smaller and shorter	38	28
¾", ⅞", 1" x 6" and shorter	15	1
New std. hex head, bulk*		
⅝" x 6" and smaller and shorter	50	42
¾", ⅞", 1" x 6" and shorter	32	21

*Minimum quantity per item: 15,000 pieces ¼", 5/16", ⅜" diam 5,000 pieces 7/16", ½" 9/16", ⅝" diam 2,000 pieces ¾", ⅞", 1" diam.

Machine Screws

	Discount
Packaged, gross list	44½—10
Bulk, bulk list*	17

*Minimum bulk quantity, 15,000 pieces per item.

Machine Screw & Stove Bolt Nuts

Packaged, package list ..... 36—10
Bulk, bulk list* 17

*Minimum bulk quantity, 15,000 pieces per item.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)..$109.00
No. 1 Ohio 102.00
Sec. quality, Pa., Md., Ky., Mo., Ill. 102.00
No. 2 Ohio 93.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)..... 16.00

Silica Brick

Mt. Union, Pa., Ensley, Ala. $115.00
Childs, Hays, Pa. 120.00
Chicago District 125.00
Western Utah 131.00
California 138.00
Super Duty Hays, Pa., Athens, Tex., Windham 132.00
Curtner, Calif. 150.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.) 19.00
Silica cement, net ton, bulk, Hays, Pa. 21.00
Silica cement, net ton, bulk, Chicago District, Ensley, Ala. 20.00
Silica cement, net ton, bulk, Utah and Calif. 28.50

Chrome Brick

Per net ton

Standard chemically bonded Balt.. $86.00
Standard chemically bonded, Curtner, Calif. 96.25
Burned, Balt. 80.00

Magnesite Brick

Standard Baltimore $109.00
Chemically bonded, Baltimore 97.50

Grain Magnesite

St. ⅜-in. grains

Domesttic, f.o.b. Baltimore in bulk fines removed $64.40
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk 38.00
in sacks 43.75

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in: Pa., W. Va., Ohio $14.50
Midwest 14.60
Missouri Valley 13.65

FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill. Price, net ton; effective CaF_2 content
72½% $44.00
70% or more 42.50
60% or less 38.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags ... 11.25¢
Canadian sponge iron, Del'd in East ..... 12.0¢
F.o.b. ship. pt., carloads... 9.5¢
Domestic sponge iron, 98+% Fe, carload lots ..... 18.0¢
Electrolytic iron, annealed, 99.5+% Fe ..... 38.0¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe 53.5¢
Hydrogen reduced iron minus 300 mesh, 98+% Fe..62.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 00.8+% Fe..83.0¢ to $1.48
Aluminum ..... 31.5¢
Brass, 10 ton lots .....39.50¢ to 86.50¢
Copper, electrolytic ..... 43.50¢
Copper, reduced ..... 43.50¢
Cadmium, 100-199 lb. 95¢ plus metal value
Chromium, electrolytic, 99% min., and quality, del'd... $3.60
Lead ..... 21.00¢
Manganese ..... 57.0¢
Molybdenum, 99% $3.75
Nickel, unannealed ..... 89.50¢
Nickel, annealed ..... 96.50¢
Nickel, spherical, unannealed 93.50¢
Silicon ..... 43.50¢
Solder powder..7.0¢ to 9.0¢ plus met. value
Stainless steel, 302 ..... 91.0¢
Stainless steel, 316 ..... $1.10
Tin .....14.04¢ plus metal value
Tungsten, 99% (65 mesh) .. $4.65
Zinc, 10 ton lots .....17.5¢ to 25.0¢

Ferroalloy Prices

(Effective Aug. 17, 1954)

Ferrochrome

Contract prices, cents per lb contained Cr, lump size, bulk, in carloads, delivered.

65-72 Cr, 2% max. Si.

0.025% C	34.50	0.20% C	33.50
0.06% C	34.50	0.50% C	33.25
0.10% C	34.00	1.00% C	33.00
0.15% C	33.75	2.00% C	32.75

65-69% Cr, 4.9% C 24.75
62-66% Cr, 4.6% C, 6-9% Si 25.60

S. M. Ferrochrome

Contract prices, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60.65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads 25.85
Ton lots 28.00
Less ton lots 29.50

High-Nitrogen Ferrochrome

Low-carbon type 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10 max. C $1.18
0.50% max. C 1.14
9 to 11% C 1.11

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed, lump 4-in. x down, 24.75¢ per lb contained Cr plus 10.80¢ per lb contained Si. Bulk 2-in. x down, 25.05¢ per lb contained Cr plus 10.80¢ per lb contained Si. Bulk 1-in. x down, 25.25¢ per lb contained Cr plus 11.00¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.

30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads 19.00
Ton lots 22.10
Less ton lots 23.60

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads 20.00
Ton lots 22.30
Less ton lots 23.30

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots 17.50
Less ton lots 19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots 16.60
Ton lots 18.10
Less ton lots 19.35

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%; Ti 9 to 11%, Ca 5 to 7%.

Carload packed 17.50
Ton lots to carload packed 18.50
Less ton lots 20.00

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn:

Producing Point	Cents per-lb
Marrietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	10.00
Clairton, Pa.	10.00
Sheridan, Pa.	10.00
Philo, Ohio	10.00

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk 12.50
Ton lots packed 14.05

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$84.00
19 to 21%	3% max.	86.00
21 to 23%	3% max.	88.50
23 to 25%	3% max.	91.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed 36.95
Ton lots 38.45

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads 30.00
Ton lots 32.00
250 to 1999 lb 34.00
Premium for hydrogen-removed metal 0.75

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ..... 21.35¢

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	30.00	31.85	33.05
0.07% max. C	27.95	29.80	31.00
0.15% max. C	27.45	29.30	30.50
0.30% max. C	26.95	28.80	30.00
0.50% max. C	26.45	28.30	29.50
0.75% max. C, 80-85% Mn, 5.0-7.0% Si	23.45	25.30	26.50

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mo, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.

Carload bulk 11.00
Ton lots 12.65
Briquet contract basis carlots, bulk, delivered, per lb of briquet 12.65
Ton lots, packed 14.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $92.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $89.50. Add $1.00 per ton for each additional 0.50% Si up to and including 17%. Add $1.45 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton lots	Carloads
96% Si, 2% Fe	20.10	18.00
97% Si, 1% Fe	20.60	18.50

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk 6.30
Ton lots 7.90

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	13.80
50% Si	10.80	85% Si	15.55
65% Si	12.20	90.55% Si	17.00

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrovanadium

35-55% contract, basis, delivered, per pound, contained V.

Openhearth ..... $3.00-$3.10
Crucible 3.10- 3.20
High speed steel (Primos) .. 3.20- 3.25

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads ..... 9.25¢
Ton lots 10.15

Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.15

Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots $9.50
Less ton lots 9.55

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb cont'd Cb plus Ta... $4.75

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo $1.35

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00
10 tons to less carload $110.00

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti..... $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots 1.55

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton $177.00

Ferrotungsten, ¼ x down, packed, per pound contained W. ton lots, f.o.b. $3.80

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. $1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.12

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.

Carload, bulk, lump ..... 15.50¢
Ton lots, packed lump ..... 16.75¢
Less ton lots, lump, packed. 17.25¢

Vanadium Pentoxide, 86-89% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.21

Zirconium, contract basis, per lb of alloy

35-40%, f.o.b., freight allowed, ton lots ..... 21.00¢
12-15%, del'd, lump, bulk-carloads ..... 8.00¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed. B, 3-4%, Si, 40-45%, per lb contained B.... $6.35

Bortam, f.o.b. Niagara Falls
Ton lots, per pound ..... 45¢
Less ton lots, per pound.... 50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.
Ton lots per pound ..... 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in., x D, Ton lots... $1.20
F.o.b. Wash., Pa.; 100 lb up
10 to 14% B ..... .55
14 to 19% B 1.30
19% min. B 1.50

Grainal, f.o.b. Bridgeville, Pa. freight allowed, 100 lb and over
No. 1 ..... $1.00
No. 6 ..... 63¢
No. 79 ..... 50¢

Manganese-Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.
Ton lots $1.40
Less ton lots 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd, less ton lots $2.80

Silcaz, Contract basis, delivered
Ton lots ..... 45.00¢

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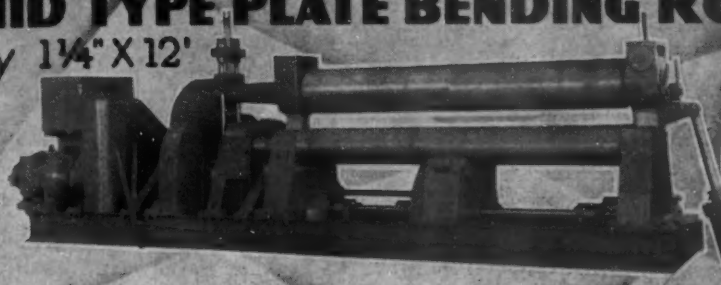

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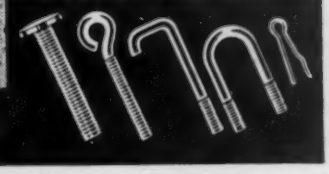

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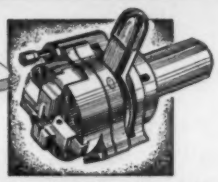

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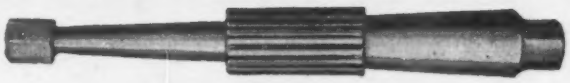

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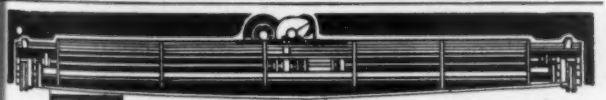

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No. 2MI CINCINNATI Vertical Mill, new 1951
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No. 4 WARNER & SWASEY Turret Lathe, Preselector head, Bar feed, new 1943
No. 12 GISHOLT Automatic Lathe, new 1947
36" BULLARD High Speed Spiral Drive Vertical Turret Lathe, 200 RPM, fine feed, new 1942
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3" bar UNIVERSAL Table Type Horizontal Boring Mill, new 1947

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30" MORTON Hydraulic Keyseater, 1942
No. 6 MITTS & MERRILL Keyseater, capacity 0 to 3" width, 30" stroke
4' FOSDICK Sensitive Radial Drill, new 1951
4' HAMMOND Jackknife Radial Drill tapping attachment, new 1948
5'-13" column CARLTON Radial Drill, AC motor & gearbox on base
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48" widened to 69" x 12' DETRICK & HARVEY Double Housing Planer, box table, DC reversing motor drive
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News of Used and Rebuilt Machinery

No Fire Sales . . . Used machinery dealers and rebuilders in Detroit reflect somewhat sadly that there won't be another Detroit Transmission fire to pull their dollar totals for 1954 up to 1953 levels.

It was in the second week in August, dealers recall, that the General Motors plant went up in a cloud of oily black smoke, leaving a wake of thousands of machine tools to be repaired or replaced. As a result, the trade found itself in the midst of a late summer boom that, fortunately, isn't likely to be repeated from a similar source.

"We did more business in August, September and October last year than we did in the rest of the entire year," one dealer told THE IRON AGE. He was emphatic, however, in stating that he would rather the boom came from causes other than disaster.

This points out the fact that there are no unusual developments at the moment that can be expected to provide a late summer prod to Detroit business. In contrast, the long automotive shutdowns are contributing to the slack that has characterized business all year.

Tool Shops Upgrade . . . Tool and die shops continue to carry the ball for used and rebuilt machinery sales. Even though these shops are not operating at the level of a year or two ago, alert operators continue to modernize and improve their shop equipment.

This accounts for the continuing demand for late model radial drills, shapers, Kellering equipment, jig borers and jig grinders. But it must be new and it must be priced right. Purchases are made today as an investment, not from necessity to get a specific job done.

Some of the dealers are finding it hard going in this type of a market. Here's the reaction of one:

"I did sell a mill today," this dealer said, "But I had it on the floor for 7 months. It was almost new and I still had to knock down the price before I could sell it."

In contrast, another dealer looks on the present market as a healthy one and counts on continuing good business. He learned the trade in the 1930's and looks with some disdain on postwar "newcomers."

Put Value First . . . "We have done less business this year and it has been on a more conservative basis," he admits. "Customers are buying value rather than necessity, A lot of shops are changing over their equipment and improving it. Remember, the used machinery business can do better when things get tough than almost any other trade."

A cross section of dealers indicate that business is about 30 per below the level of last year, and without the GM fire to lift the level in late summer. Some are better than that, others worse, but most agree that around one third lower is the average decline for the industry.

While demand for production machinery is down, a good demand for punch presses exists. This is somewhat of a surprise since stamping plants here are not enjoying particularly good business. This demand, then, also must be traced to a trend toward plant modernization. Stamping is very competitive coastwise. Bidding for jobs is close to the profit line.

Report Slow Summer . . . Eastern dealers in New York and New England centers report business generally slow, or quiet. One dealer, however found more sales activity in small, late-model tools.

Machinery dealers, in the East as in most regions are hoping for a fall pickup in activity to give a better looking balance sheet for the final quarter than the one that's shaping up for the present 3-month period.